PS-X9

AEP Model
E Model

STEREO TURNTABLE SYSTEM

SPECIFICATIONS

GENERAL

Power Requirements:	110, 220V ac, 50/60 Hz
Power Consumption:	50W
Dimensions:	Approx. 540 (w) x 220 (h) x 450 (d) mm 21 1/4 (w) x 8 5/8 (h) x 17 3/4 (d) inches Including projecting parts and controls
Weight:	Approx. 35 kg, 77 lb 3 oz (net) Approx. 39 kg, 86 lb (with shipping carton)

TURNTABLE

Platter:	38 cm (15 inches), diecasting aluminum alloy
Motor:	Linear BSL (brushless and slotless) dc servo motor
Drive System:	Direct drive, crystal lock control system
Speeds:	33 1/3, 45 rpm
Speed Control Range:	±6% (crystal lock OFF)
Starting Characteristics:	Comes to nominal speed Within 1/8 revolution (33 1/3 rpm) Within 1/5 revolution (45 rpm)
Wow and Flutter:	±0.03% (DIN) 0.02% (WRMS)
S/N Ratio:	75 dB (DIN-B)
Initial Drift:	Within 0.0001% (crystal lock ON)
Load Characteristics:	0% up to 1,100 g tracking force
Speed Deviation:	Within 0.002% (crystal lock ON)
Automatic System:	Arm return reject

TONEARM

Type:	Statically balanced, universal
Pivot to Stylus Length:	264 mm (10 3/8 inches)
Overall Arm Length:	356 mm (14 inches)
Overhang:	14 mm (1/2 inches)
Tracking Error:	+1° 45′, −1° 18′
Tracking Force Adjustment Range:	0–3 g
Cartridge Weight Range: (including shell)	10.5–18.5 g (with the small counterweight) 18–33 g (with the large counterweight)

— Continued on page 2 —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®

SERVICE MANUAL

CARTRIDGE XL-55 PRO

Type:	Moving-coil
Output Voltage:	0.2 mV (1 kHz, 5 cm/sec, 45°)
Frequency Response:	10–50,000 Hz
Channel Separation:	More than 30 dB (1 kHz)
Channel Balance:	Less than 1.0 dB (1 kHz)
DC Resistance:	40Ω
Impedance:	40Ω (1 kHz)
Load Impedance:	More than 40Ω
Compliance:	15×10^{-6} cm/dyne
Tracking Force:	1.5–2.5 g (recommended value 2.0 g)
Type of Stylus:	Elliptical (0.3 x 0.8 mil) Nude diamond
Weight:	22 g (including the shell)

AUDIO SECTION

System:	Head amplifier first stage LEC transistor differential amplifier Equalizer amplifier first stage direct-coupled dual-FET differential amplifier, NF type final stage SEPP
Outputs:	PHONO LINE OUT voltage 150 mV (max. 14 V) impedance 600Ω

HEAD AMPLIFIER + EQUALIZER AMPLIFIER

S/N Ratio:	80 dB (A weighting network, 0.2 mV)
Harmonic Distortion:	Less than 0.005% at 1 V output (20–20,000 Hz)
Voltage Gain:	63 dB (1 kHz)
Input Impedance:	100Ω
Maximum Input Capability:	10 mV

EQUALIZER AMPLIFIER

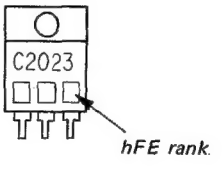
S/N Ratio:	87 dB (A weighting network, 2.5 mV)
Harmonic Distortion:	Less than 0.005% at 1 V output (20–20,000 Hz)
RIAA Curve Deviation:	20–20,000 Hz ± 0.2 dB
Voltage Gain:	36 dB (1 kHz)
Input Impedance: (selectable)	Load resistance 25 kΩ, 50 kΩ, 100 kΩ Load capacitance 100pF, 200pF, 400pF
Maximum Input Capability:	240 mV (1 kHz)

SERVICING NOTE

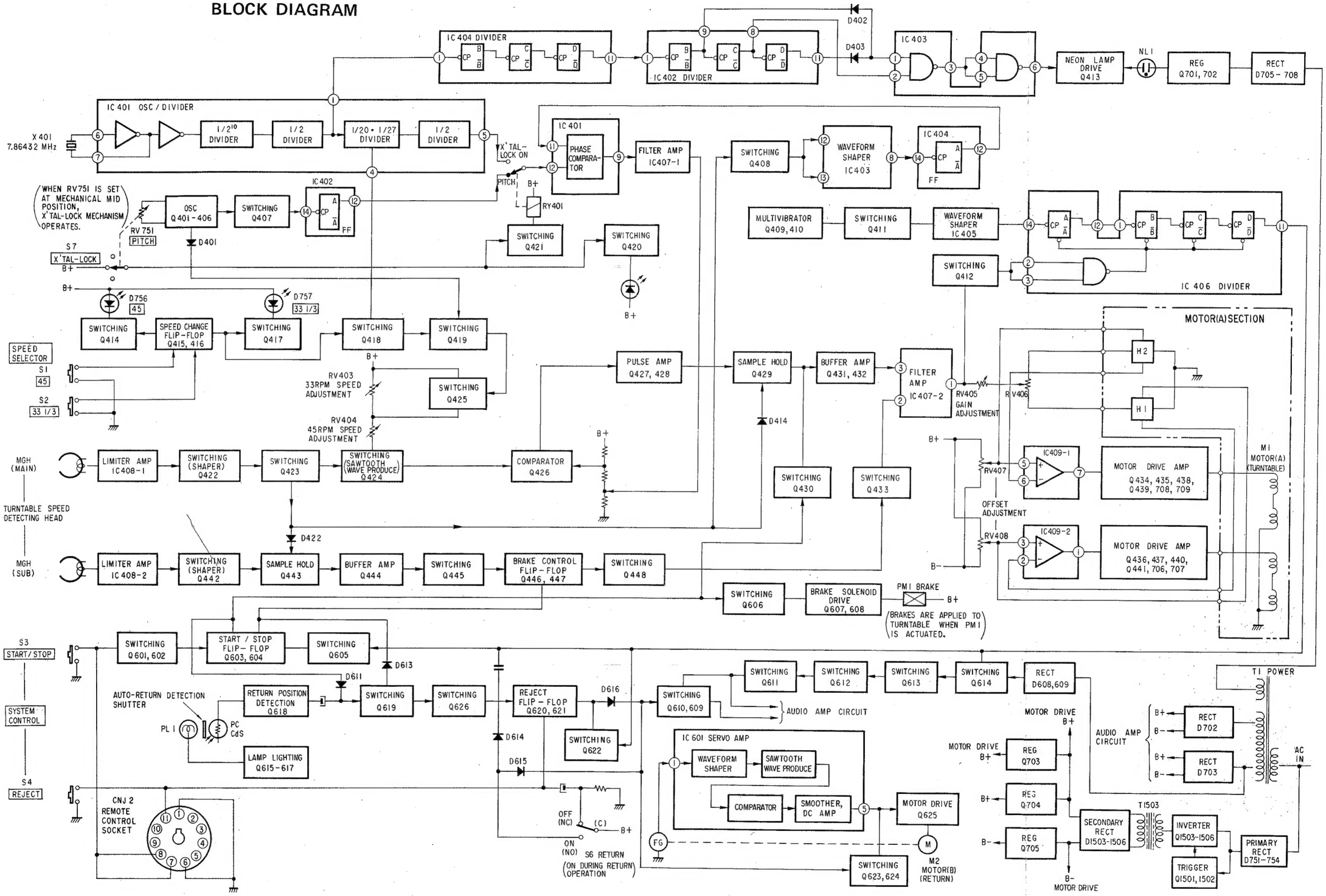
INVERTER CIRCUIT TRANSISTOR REPLACEMENT (Q1503–1506)

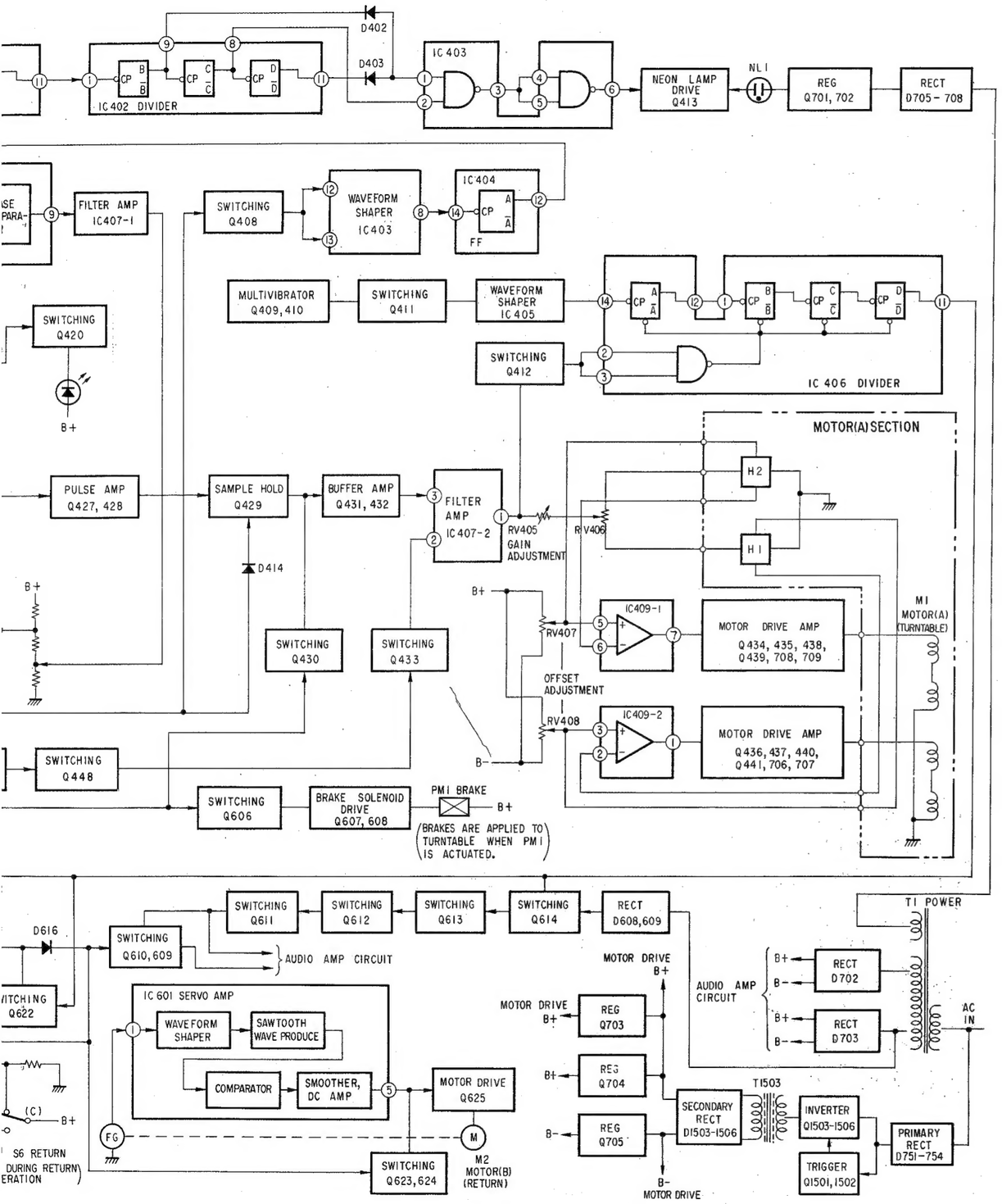
CAUTION

When replacing Q1503–1506 in the pulse power-supply circuit, use those which have the same hFE rank.



SECTION 1
BLOCK DIAGRAM

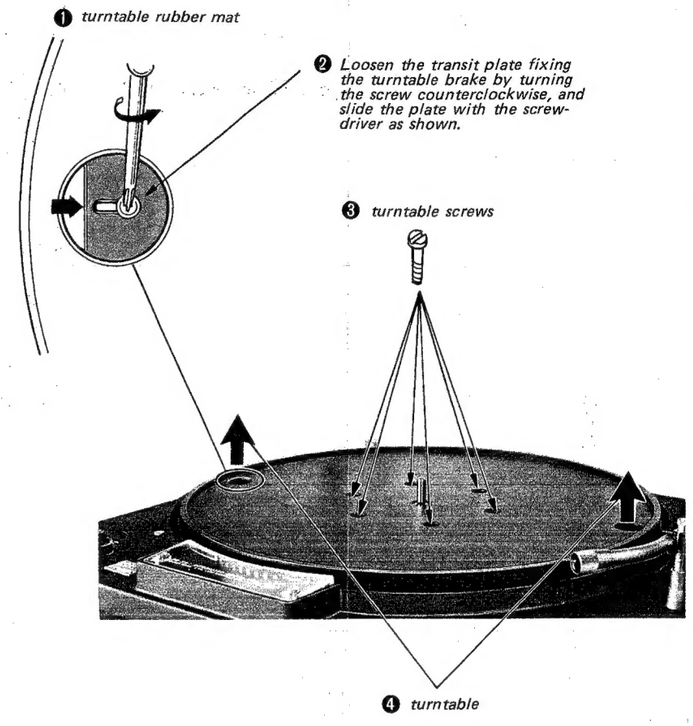




SECTION 2
DISASSEMBLY AND INSTALLATION

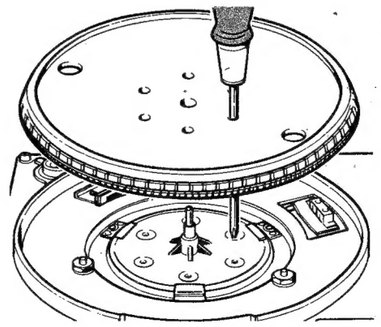
Note: Follow the disassembly procedure in the numerical order given.

TURNTABLE REMOVAL

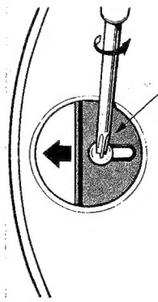


NOTE ON THE TURNTABLE ASSEMBLY

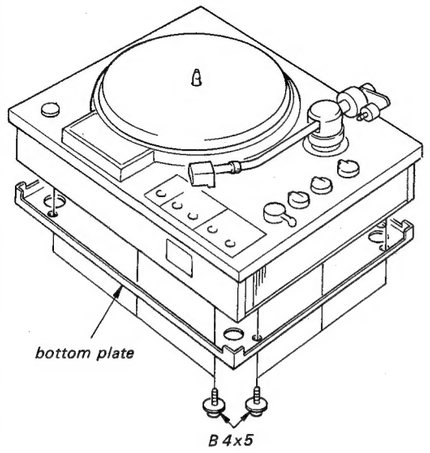
❶ *Place the turntable so as to match a screw hole of the motor board with one on the turntable as shown.*



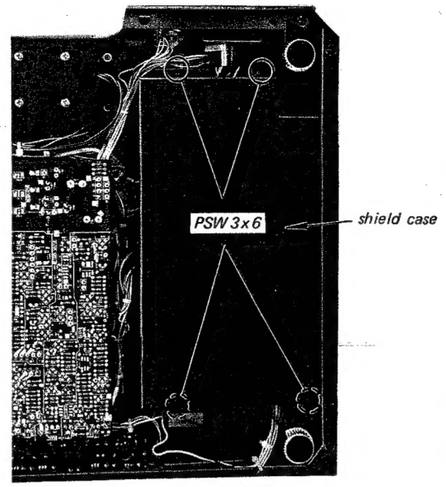
❷ *Loosen the transit plate fixing the turntable brake by turning the screw counterclockwise. Slide the plate with the screw-driver as shown and then fasten the screw again.*



BOTTOM PLATE REMOVAL

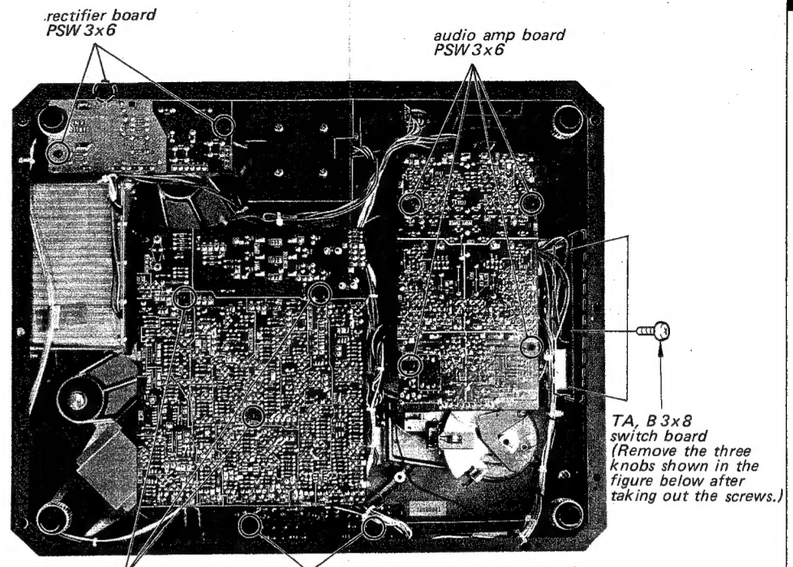


SHIELD CASE REMOVAL

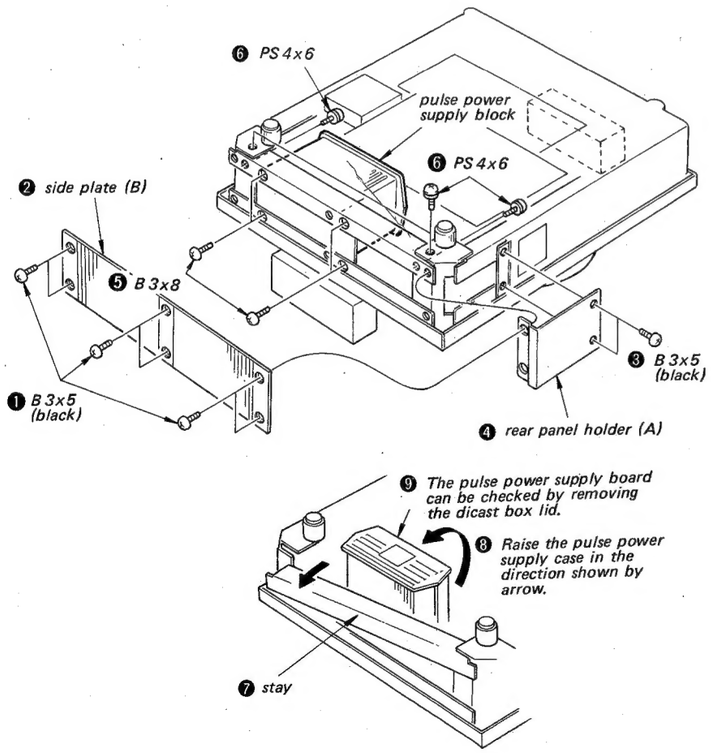


CIRCUIT BOARD REMOVAL

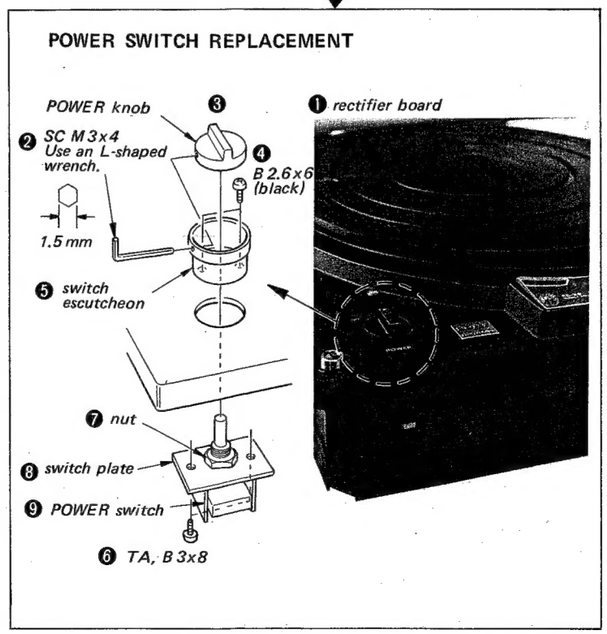
Under this condition, the each circuit board can be checked. When replacing the parts on the circuit board, remove the each screw as shown.

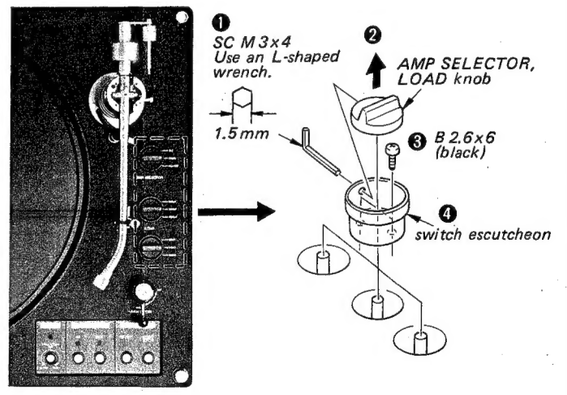


PULSE POWER SUPPLY BLOCK REMOVAL



POWER SWITCH REPLACEMENT

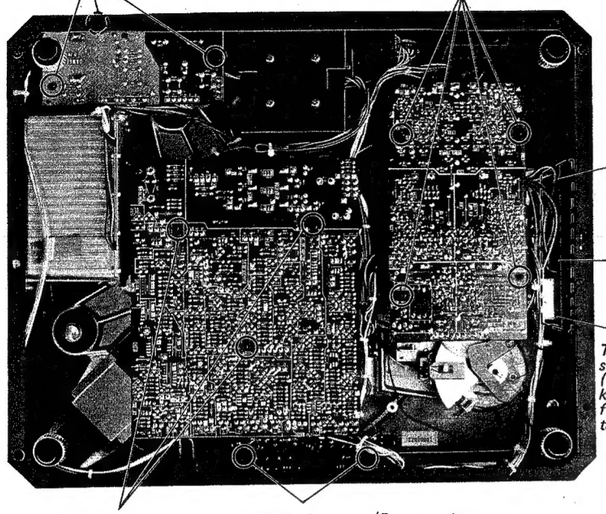




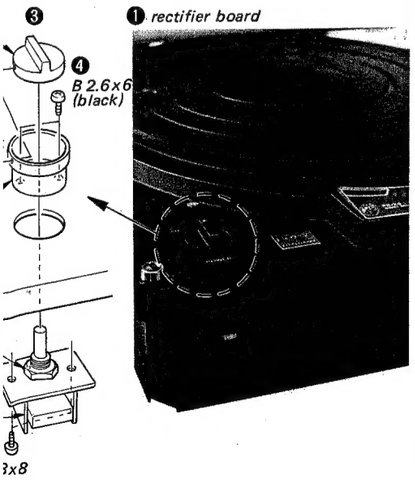
– shield case

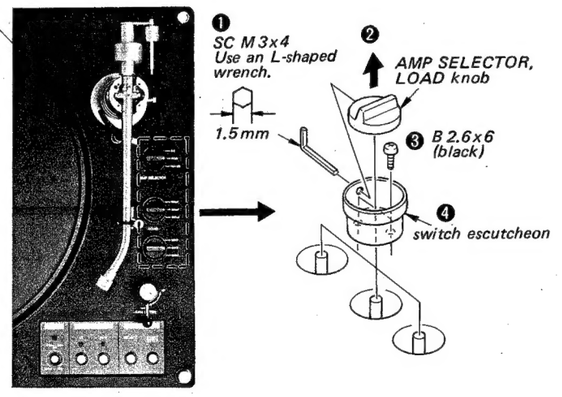
CIRCUIT BOARD REMOVAL

Under this condition, the each circuit board can be checked. When replacing the parts on the circuit board, remove the each screw as shown.

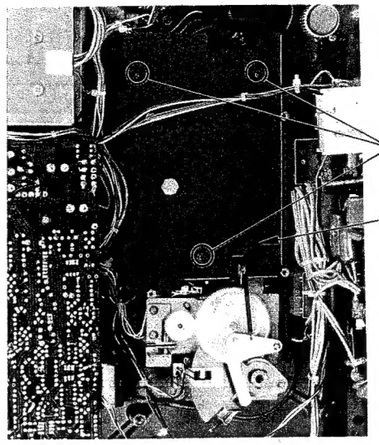


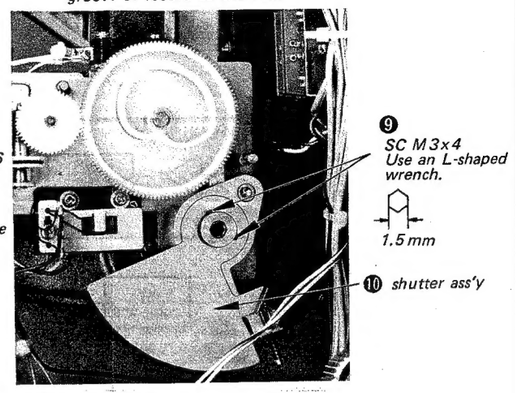
H REPLACEMENT

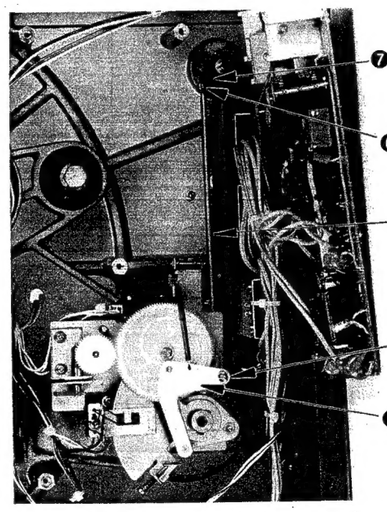


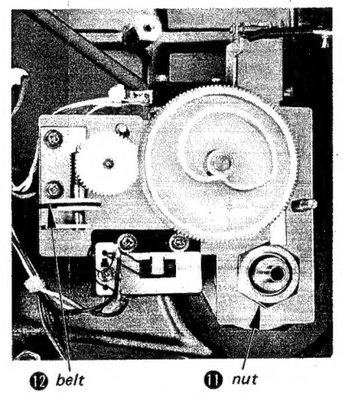


TONEARM REMOVAL

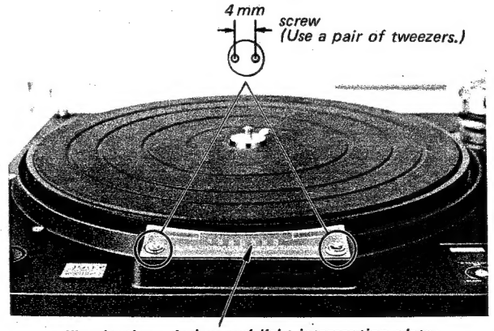


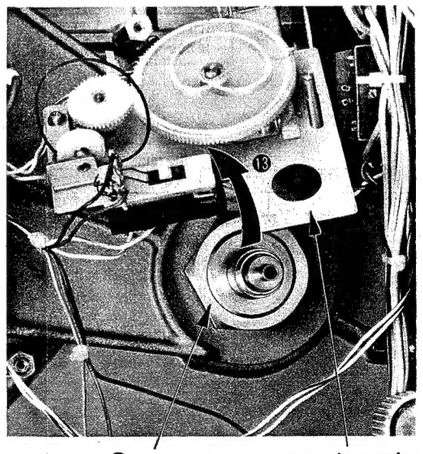






STROBOSCOPE NEON LAMP REPLACEMENT

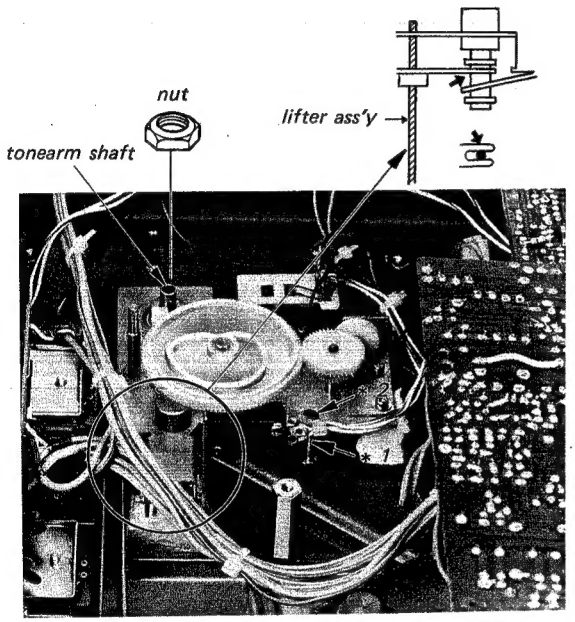




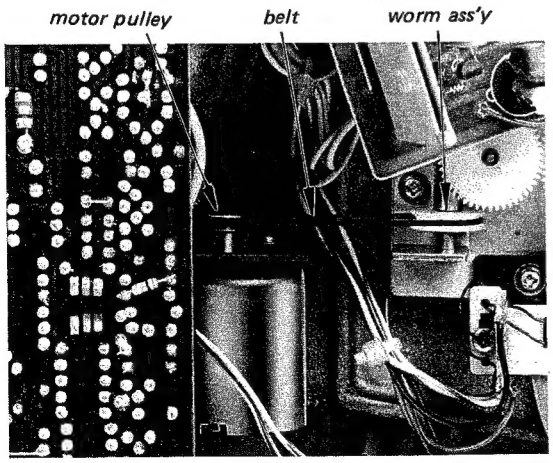
The tonearm can be removed by performing step ⓯.

TONEARM INSTALLATION

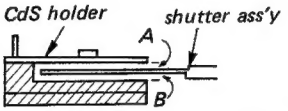
1. Install the lifter ass'y as shown.
2. Insert the shaft (* 1) into the hole (* 2).
3. Install the nut to the tonearm shaft.

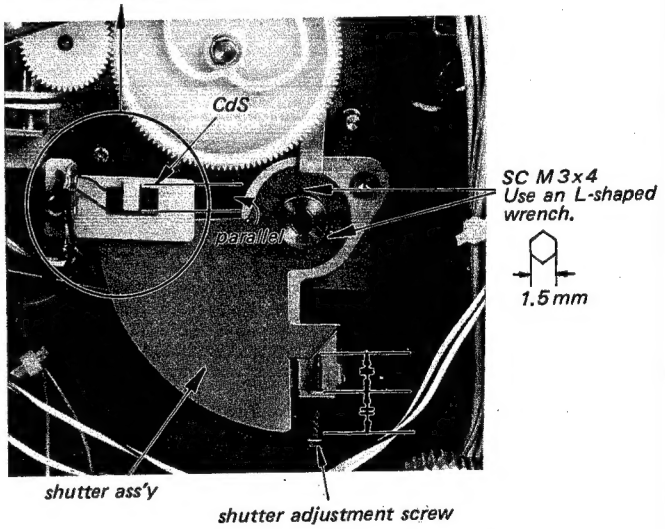


4. Install the belt.
5. Make sure that the motor pulley is even with the worm ass'y.

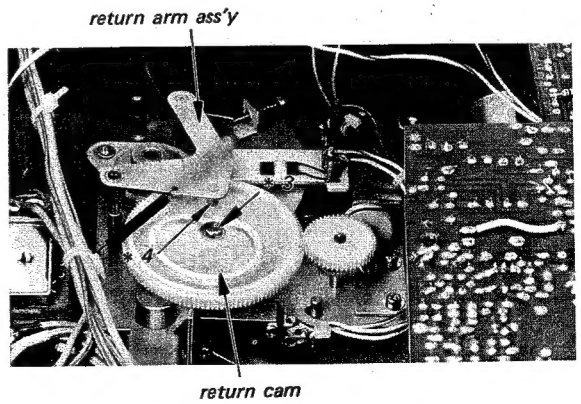


6. Adjust the tonearm so that clearance A is equal to B in the figure below.
7. Turn the shutter adjustment screw clockwise by half a turn.
8. When moving the tonearm toward the lead-out groove of record to the full, turn the screw so that CdS is parallel with shutter ass'y.
9. Temporarily, set the shutter ass'y with a screw (SC M 3×4).
10. Make the automatic-return adjustment on page 15.

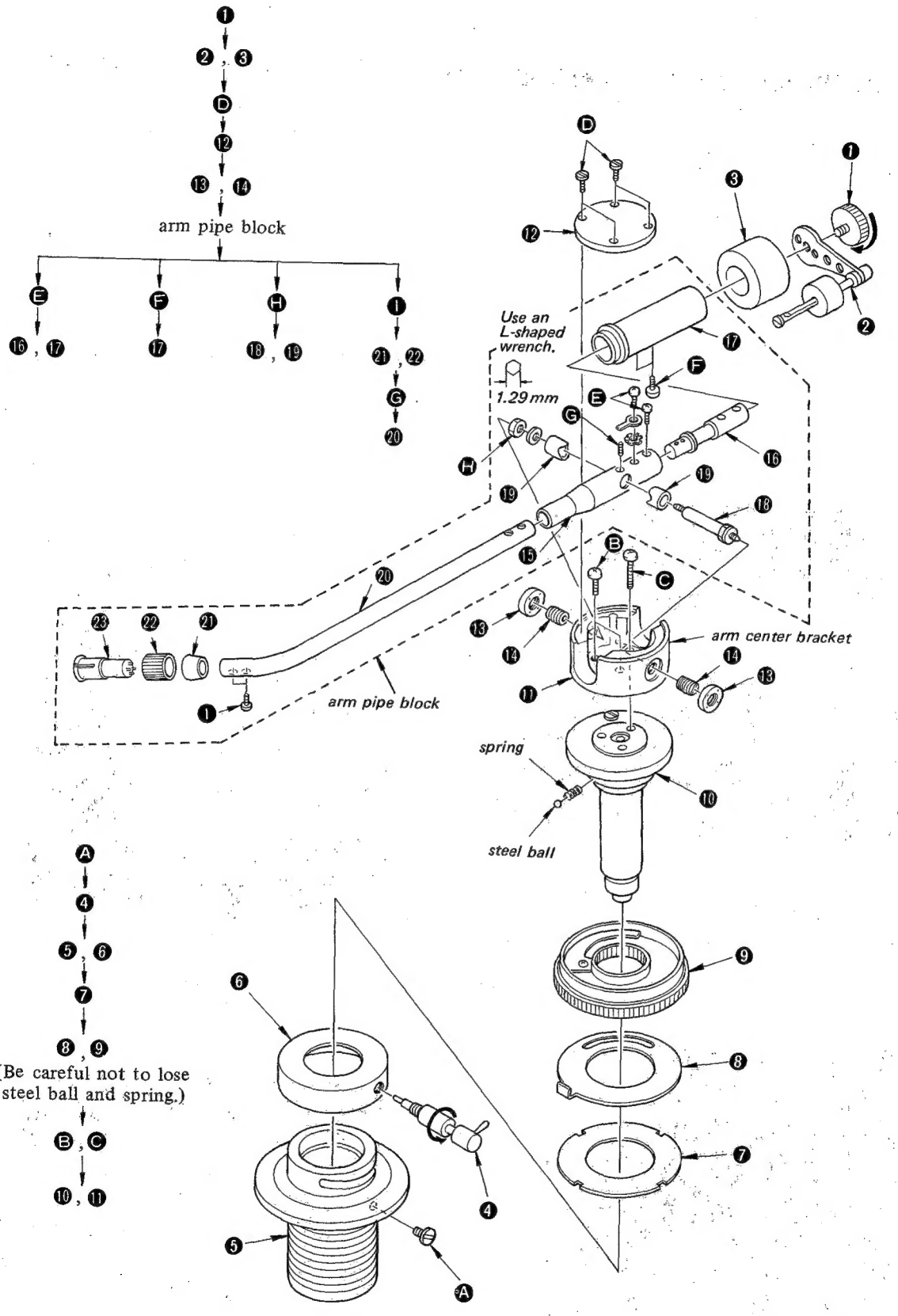




11. Install the return arm ass'y. Make sure that the shaft (* 4) is inserted into the bearing (* 3).



TONEARM BLOCK DISASSEMBLY



TONEARM BLOCK ASSEMBLY

1. Thread the lead wires into the arm pipe. (Refer to Fig. 1.)

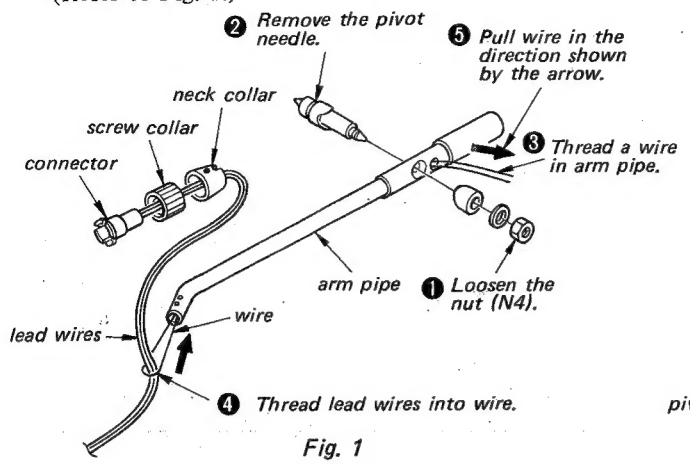


Fig. 1

2. Install the neck-cylinder connector, screw collar and neck collar to the arm pipe. (Refer to Fig. 2.)

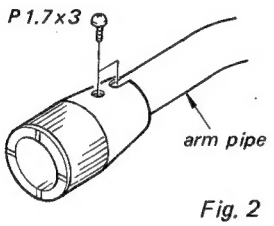


Fig. 2

3. Thread the lead wires into the rotation shaft ass'y. (Refer to Fig. 3.)

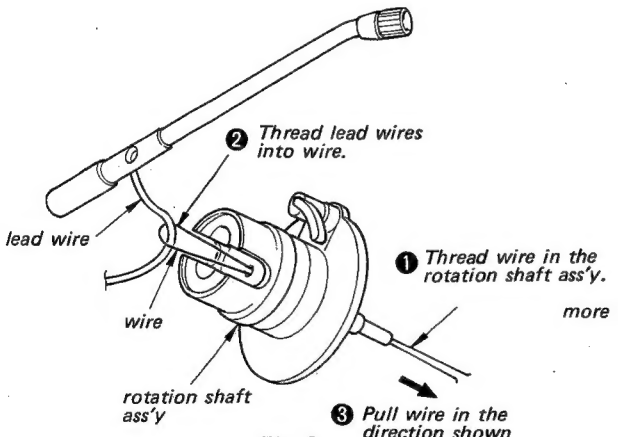
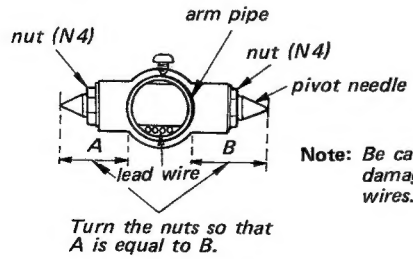


Fig. 3

4. Install the pivot needle.



Note: *Be careful not to damage the lead wires.*

Fig. 4

5. Install the arm pipe to the rotation shaft ass'y.
   1) Loosen the pivot bearings and lock nuts.
   2) Install the pivot needle as shown in Fig. 5. Temporarily, secure the two bearings for A = B as shown in Fig. 6. Do not tighten the two bearings strongly.

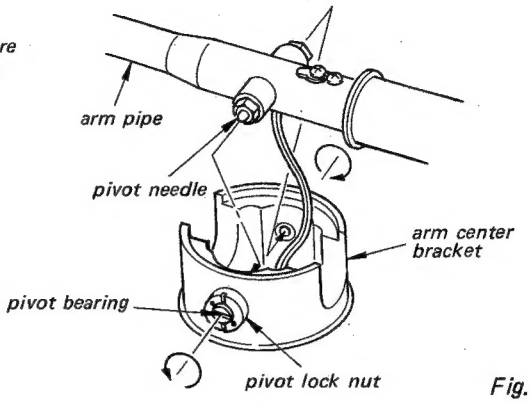


Fig. 5

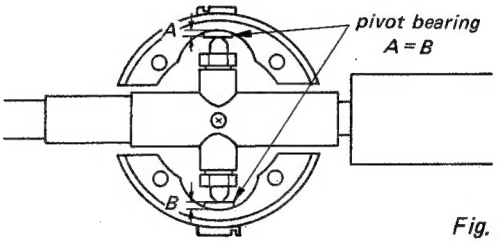


Fig. 6

   3) Install the tonearm, and make the balance adjustment with the two bearings. (Refer to Fig. 7 and Fig. 8.)
      a. When the 20 mg weight is placed on the top of the shell (just above a stylus), the tonearm sinks more than 3 mm (measured at the stylus tip).
      b. When the weight is removed, the tonearm returns horizontally.

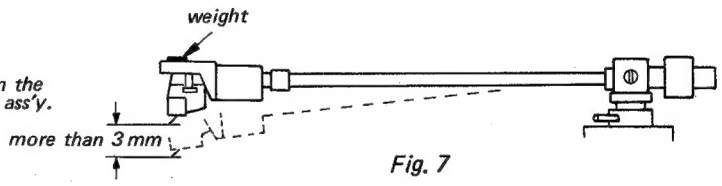


Fig. 7

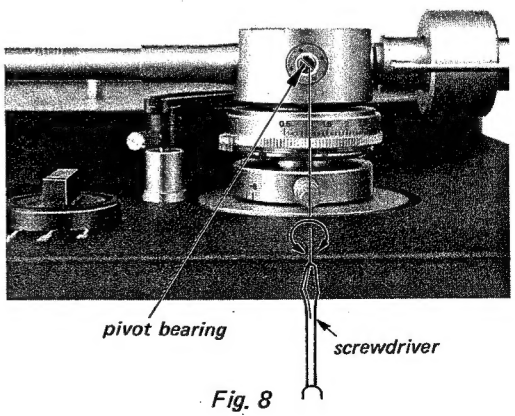


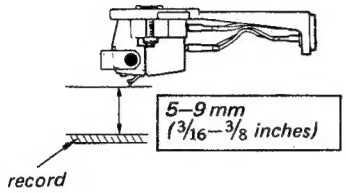
Fig. 8

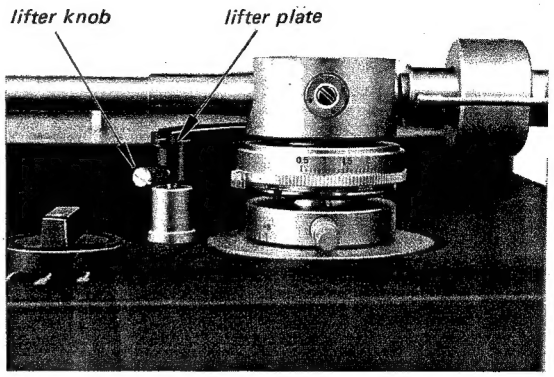
SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENT

LIFTER PLATE HEIGHT ADJUSTMENT

1. Bring the tonearm above the record.
2. Set the arm lifter to UP position.
   Make sure that the distance between the record and the stylus is 5–9 mm (3/16–3/8 inches).
3. If necessary, adjust the height of arm lifter by loosening the lifter knob.





3-2. ELECTRICAL ADJUSTMENTS

SPEED DETECTING HEAD (MGH) POSITION ADJUSTMENT

Make this adjustment when replacing the speed detecting head and the turntable.

The improper adjustment will result in wow and flutter and mis-operation of servo control.

1. Remove the turntable. (Refer to page 5.)
2. Temporarily, secure the head bracket (with head mounted) to the frame.
3. Stick a visiting card (0.3 mm in thickness) on the magnet-coated rim as shown in Fig. 9 (a).
4. Install the turntable described on page 5.
5. Bring the head above the visiting card as shown in Fig. 9 (b).
   Adjust the position of head bracket so that the two heads touch the visiting card at the center of head slightly as shown in Fig. 9 (b).
6. Remove the turntable gently. Fix the two head bracket screws.
7. Remove the visiting card and install the turntable. Make sure that the two heads do not touch the magnet-coated rim.
8. Turn on the POWER switch and rotate the turntable at 33 rpm.
9. Connect an oscilloscope across the head as shown in Fig. 11.
10. Make sure that the waveform on the oscilloscope is shown in Fig. 10.
11. Adjust the two screws (*1) when phase difference is improper, and the two screws (*2) when output voltage is improper.
    (Refer to Fig. 9 (b).)

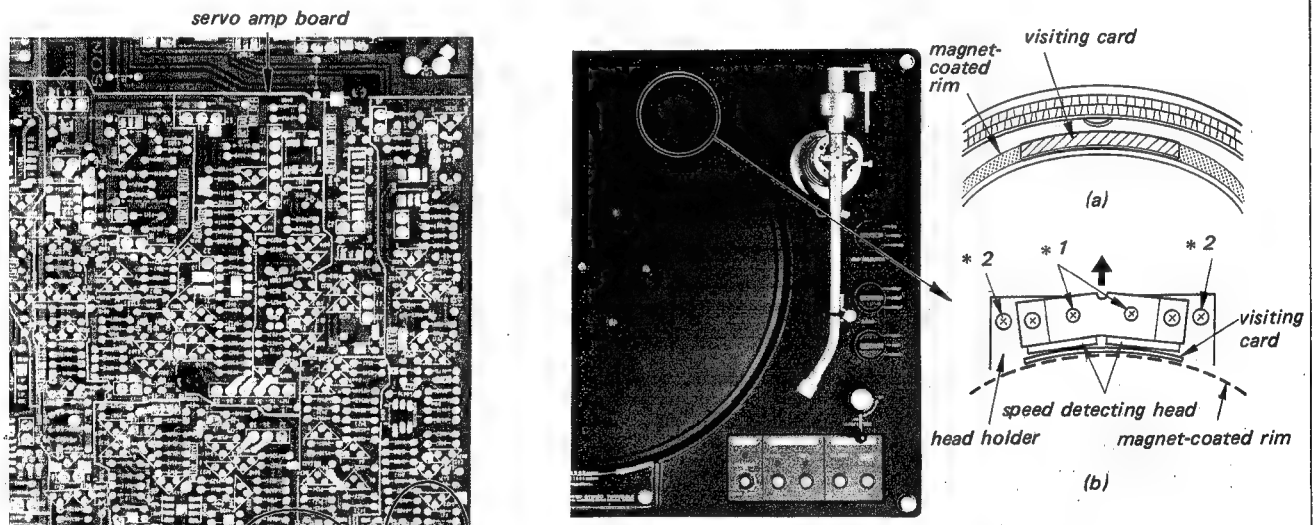


Fig. 9

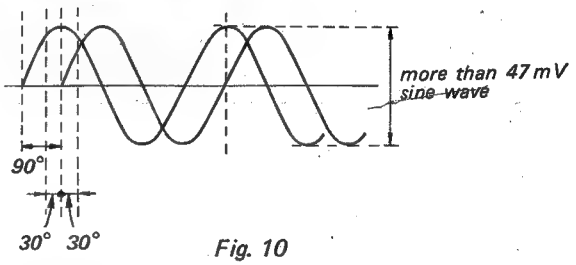


Fig. 10

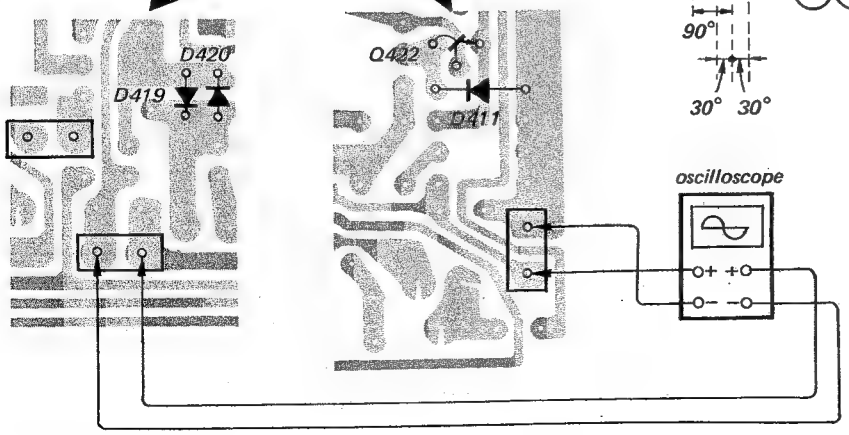


Fig. 11

HALL DEVICE GAIN ADJUSTMENT (33 1/3 rpm)

1. Disconnect the jumper wire, and supply 1 V dc as shown in Fig. 14.
2. Connect an oscilloscope to H1 and adjust RV405 and RV406 for 6Vp-p on the oscilloscope.
3. Connect an oscilloscope to H2 and adjust RV405 and RV406 for 6Vp-p on the oscilloscope.
4. Repeat the steps 2 and 3 two or three times.

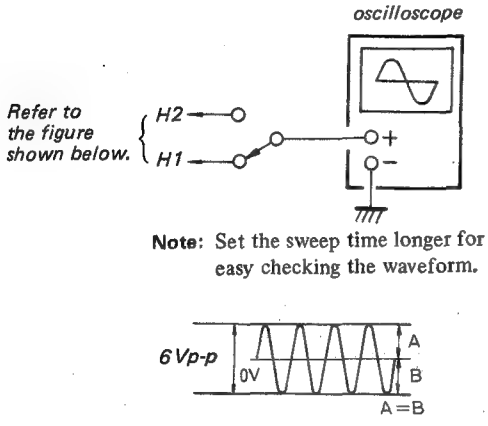


Fig. 12

MOTOR AMP OFFSET ADJUSTMENT (33 1/3 rpm)

1. Disconnect the jumper wire, and supply 1 V dc as shown in Fig. 14.
2. Connect a VTVM (or oscilloscope) to H1 and adjust RV407 for 0V dc reading on the VTVM (for waveform shown below when using oscilloscope).
3. Connect a VTVM (or oscilloscope) to H2 and adjust RV408 for 0V dc reading on the VTVM (for waveform shown below when using oscilloscope).

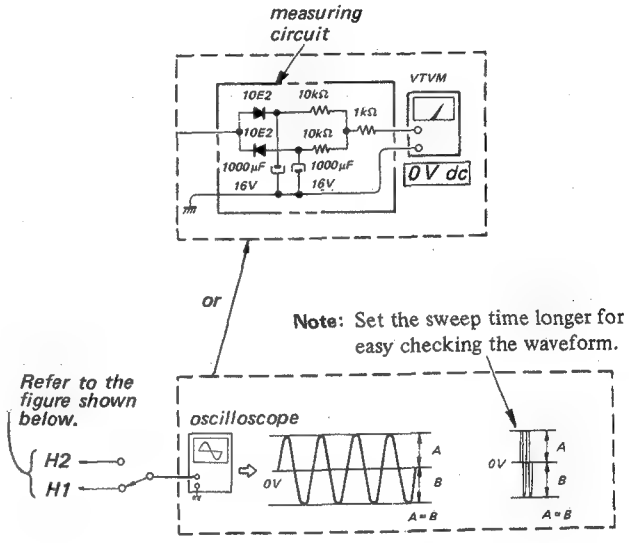
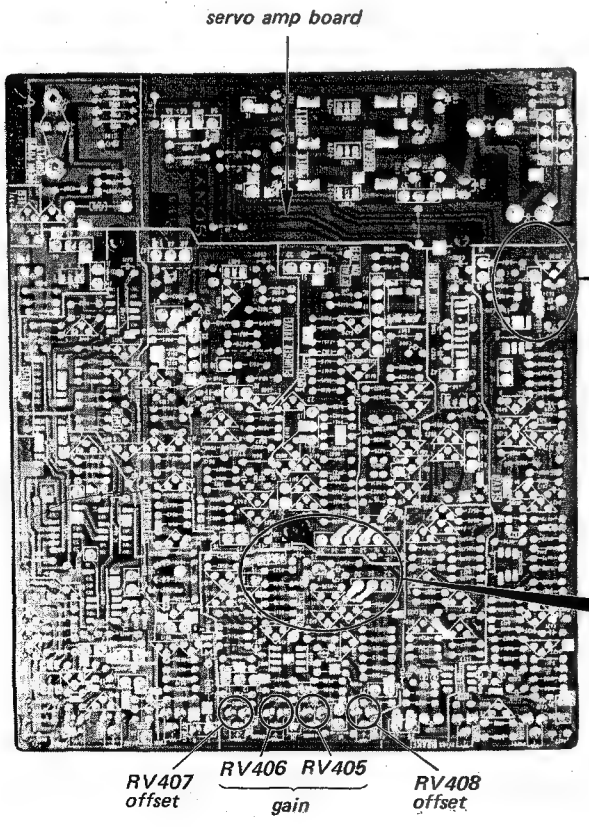


Fig. 13



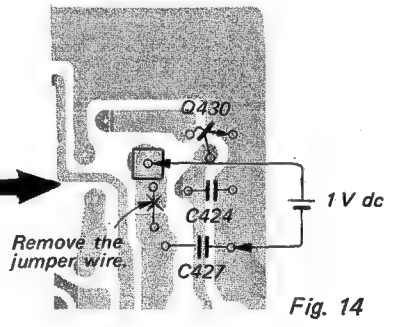


Fig. 14

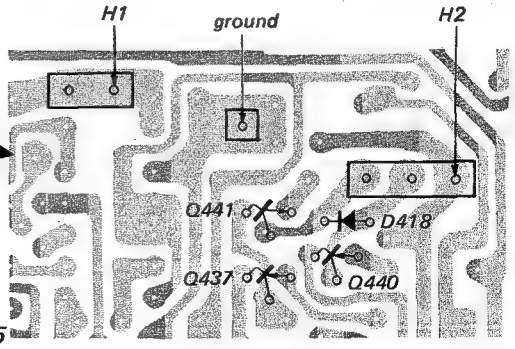
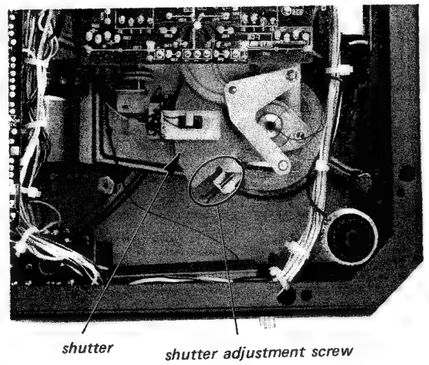
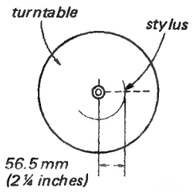


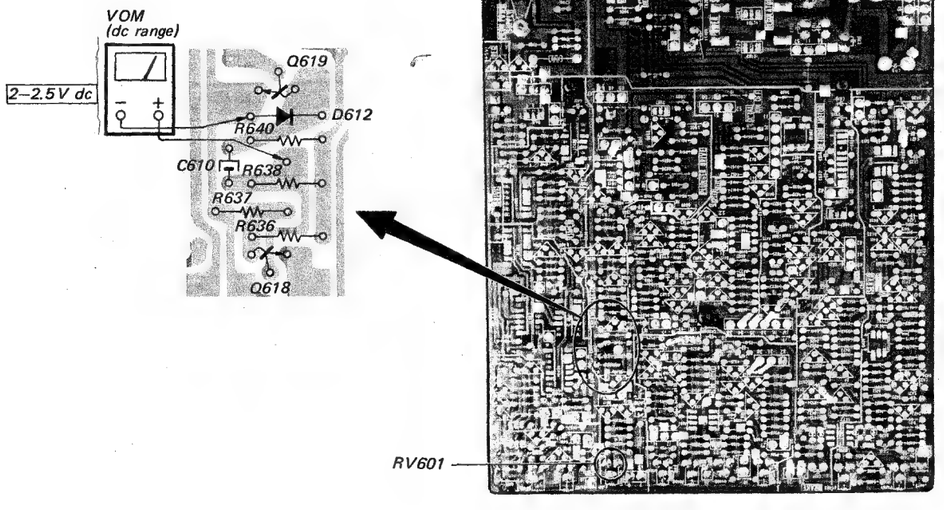
Fig. 15

AUTOMATIC RETURN POSITION ADJUSTMENT

1. Connect a VOM as shown below.
2. Bring the tonearm toward out-of lead groove of record to the full.
3. Adjust RV601 for 2–2.5 V dc reading on the VOM.
4. When the stylus is set as shown below, adjust the shutter adjustment screw for 8 V dc reading on the VOM.
5. Play a test record (SONY YFSC-6, BAND 2) at 33 rpm. Confirm that the tonearm automatically returns within 15–17 counts.
   If not, adjust the shutter adjustment screw again.
6. Play a test record (SONY YFSC-6, BAND 3–6) at 33 rpm. Make sure that the tonearm returns only when 1 kHz signal sound is output from a speaker. If not, adjust RV601.
7. When RV601 is readjusted, repeat the steps 5 and 6.

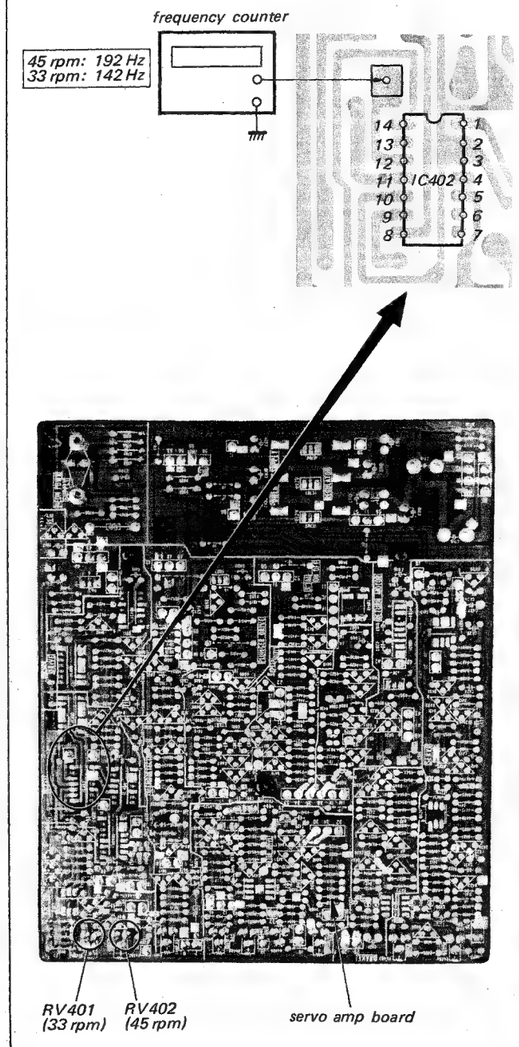






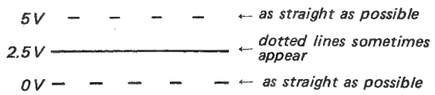
OSCILLATOR FREQUENCY ADJUSTMENT

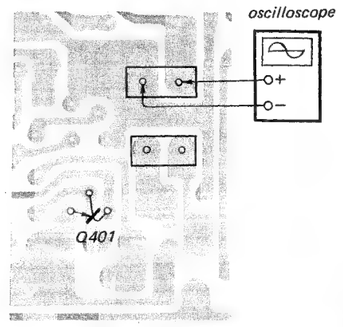
1. Connect a frequency counter to terminal (12) of IC402 on the servo amp board.
2. Set the speed switch to 45 rpm position.
3. Adjust RV402 for 192 Hz on the counter.
4. Set the speed switch to 33 rpm position.
5. Adjust RV401 for 142 Hz on the counter.

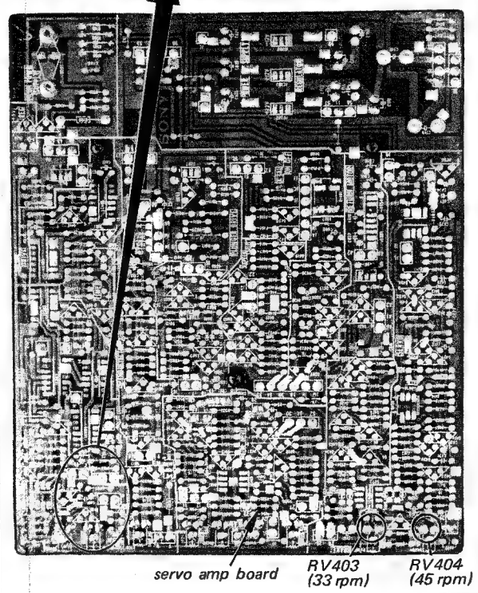


TURNTABLE SPEED ADJUSTMENT

1. Connect an oscilloscope to terminal (9) of IC401.
2. Set the crystal-lock switch to X'TAL-LOCK position.
3. Set the speed switch to 45 rpm position.
4. Adjust RV404 for waveform on the oscilloscope as shown below.
5. Set the speed switch to 33 rpm position.
6. Adjust RV403 for waveform on the oscilloscope as shown below.

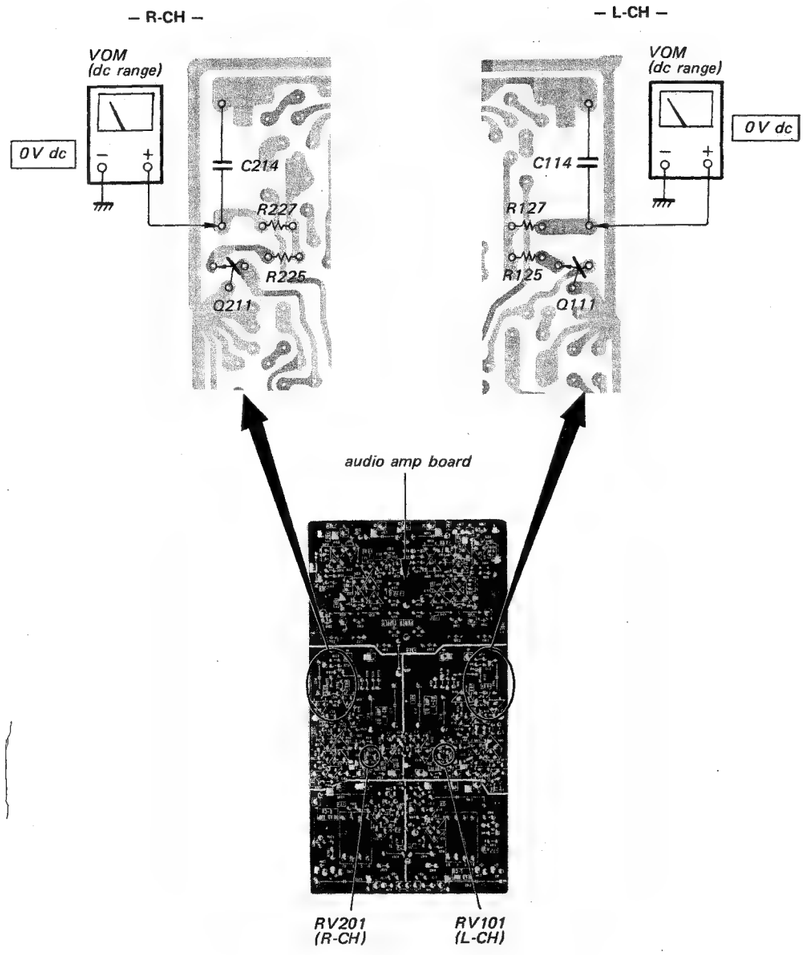






DC BALANCE ADJUSTMENT

1. Turn on the POWER switch.
2. Adjust RV101 (L-CH) and RV201 (R-CH) for 0V dc on the VOM with no signal input.



RV404 (45 rpm)

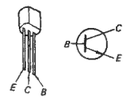
Replacement Semiconductors

For replacement, use semiconductors except in ( ).

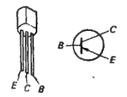
Q402, Q407–412, Q414–424, Q429–432, Q442–448, Q601–606, Q609–614, Q616–624, Q626, 1502: 2SC1364

Q434, 436, Q439, 441: 2SC1509

Q608: 2SC1475

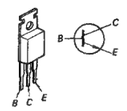


Q435, 437, Q438, 440: 2SA777

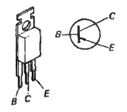


Q607, 615, Q625: 2SC1061

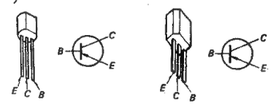
Q703, 704, Q706, 708: 2SD476A



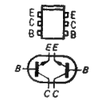
Q705, 707, Q709: 2SB566A



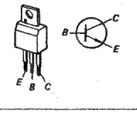
Q401, Q404–406, Q425, 427, Q428, 433, Q1501: 2SA893 (2SA678)



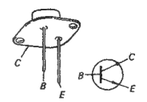
Q403, 426: 2SC1963



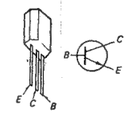
Q413: 2SC2278 (2SC1127)



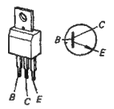
Q701: 2SC1431



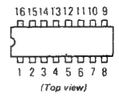
Q702: 2SC926A



Q1503–1506: 2SC2023-R (2SC2023)

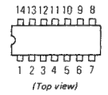


IC401: MSM5811



IC402, 404, IC406: M53293P (SN7493AN)

IC403, 405: M53200P (SN7400N)



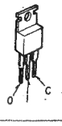
IC407–409: μPC1458C (μPC1458)

IC601: CX065A

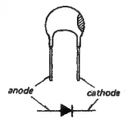
IC701: μPC78L05

IC702, 703: μPC14312H

IC704: FS7912M



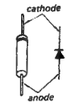
D409, 410, D415, 416, D419, 420, D604, 606: VD1221



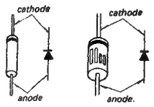
D401–404, D411–414, D417, 418, D421–424, D601–603, D611–616: 1S1555 (1T40)

D1501, 1502: 1S1555

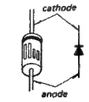
D407, 605: RD3.9E



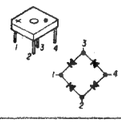
D405, 408, D608, 609, D704, 1001: 10E2 (SIB01-02)



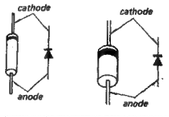
D406: EQB01-05 (EQA01-05R)
D607: EQB01-13 (EQA01-13)
D610: EQB01-06 (EQA01-06R)
D709, 711: EQB01-33 (EQA01-33R)
D710: EQB01-20 (EQA01-20R)
D712: EQB01-18 (EQA01-18R)
D713: EQB01-12Z (EQA01-12R)



D702, 703: S2VB20

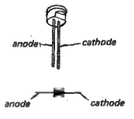


D705–708: 10E2 (GP08D)

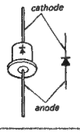


D751–754: U05G (U05E)

D755–757: SLP24B



D1503–1506: S34



H1, 2: 5GF-MS-07F

SECTION 4
DIAGRAMS

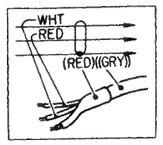
4-1. MOUNTING DIAGRAM (SYSTEM CONTROL SECTION)

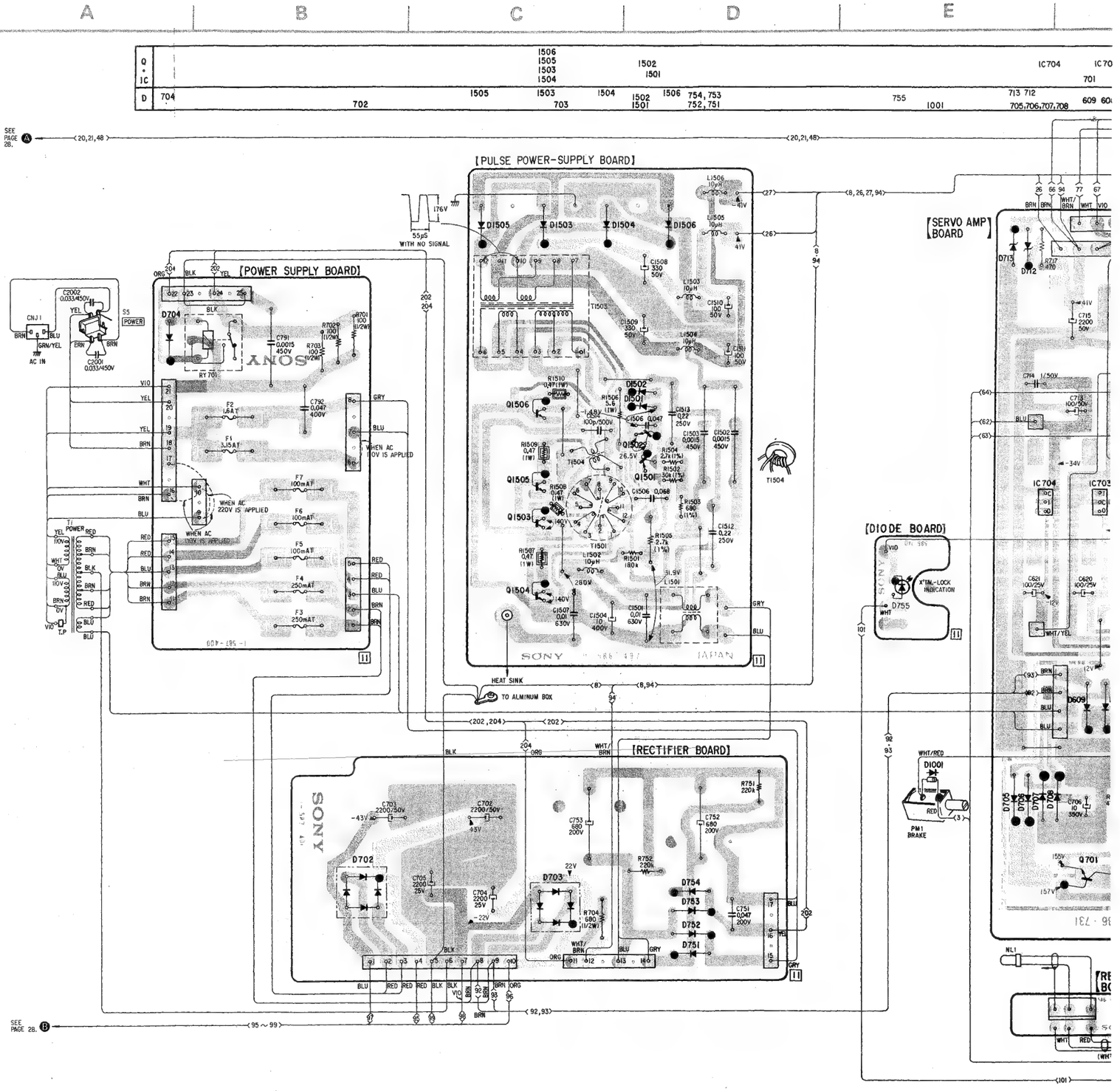
– Conductor Side –

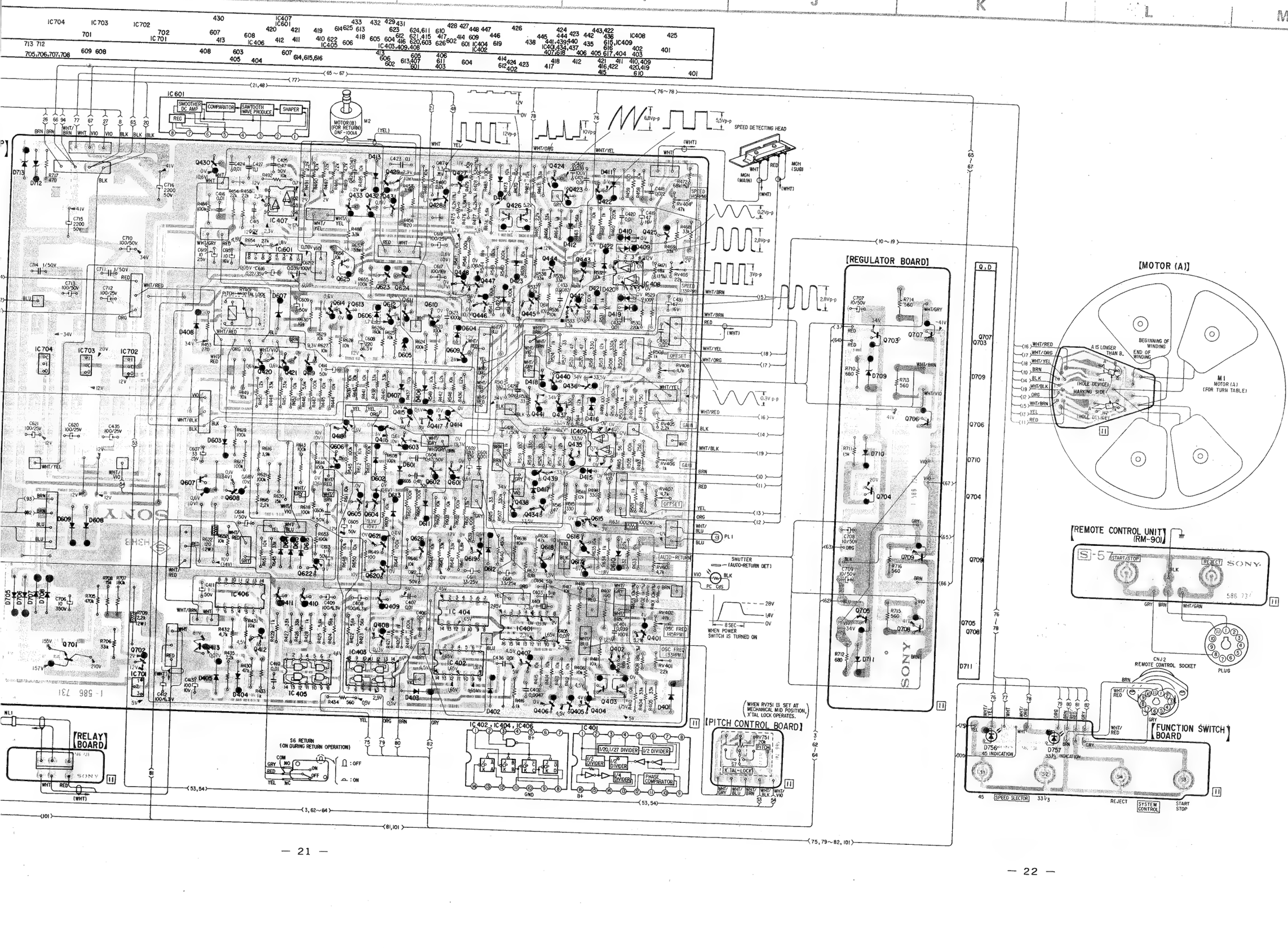
Replacement Semiconductors: See page 18.

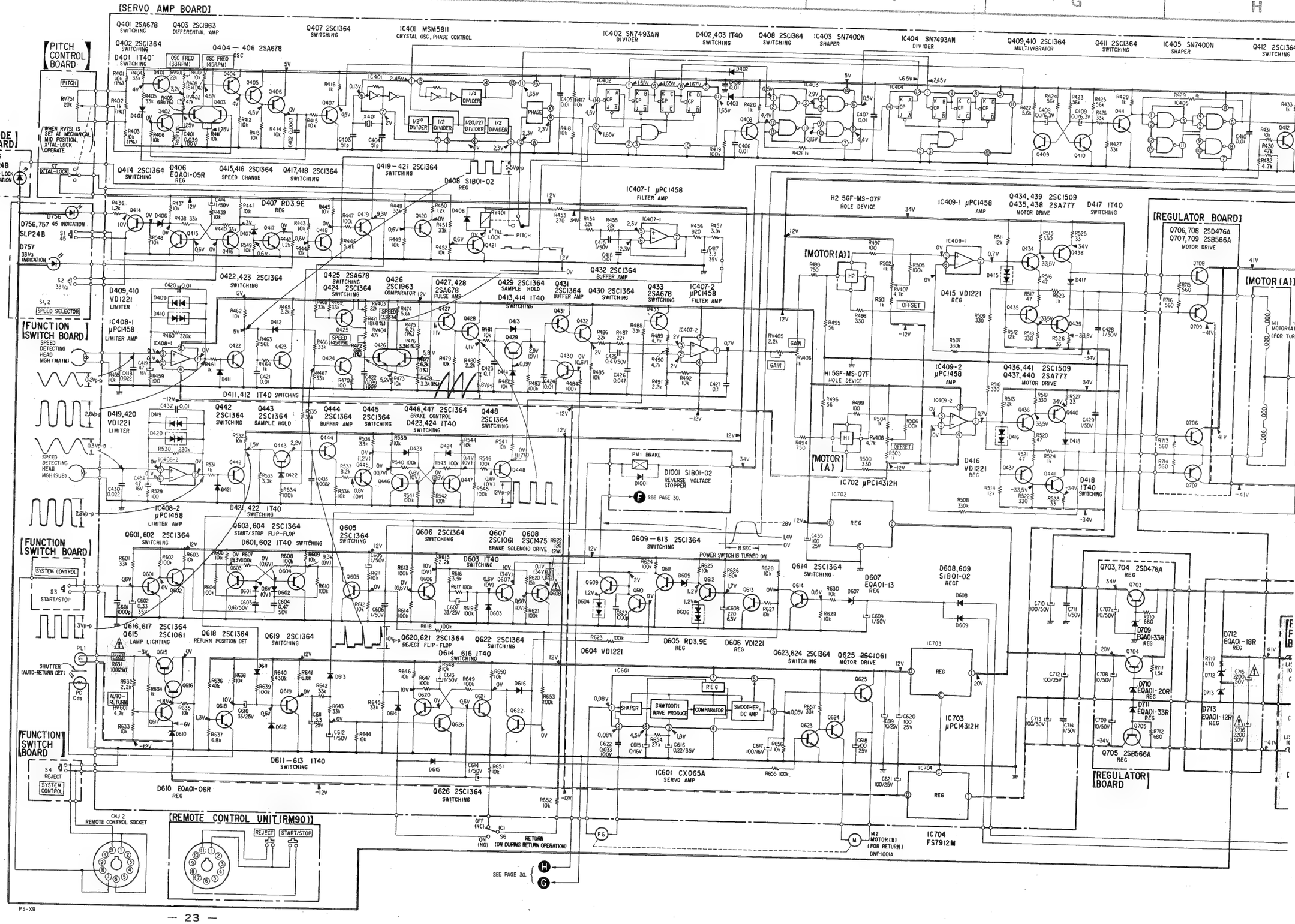
Note:

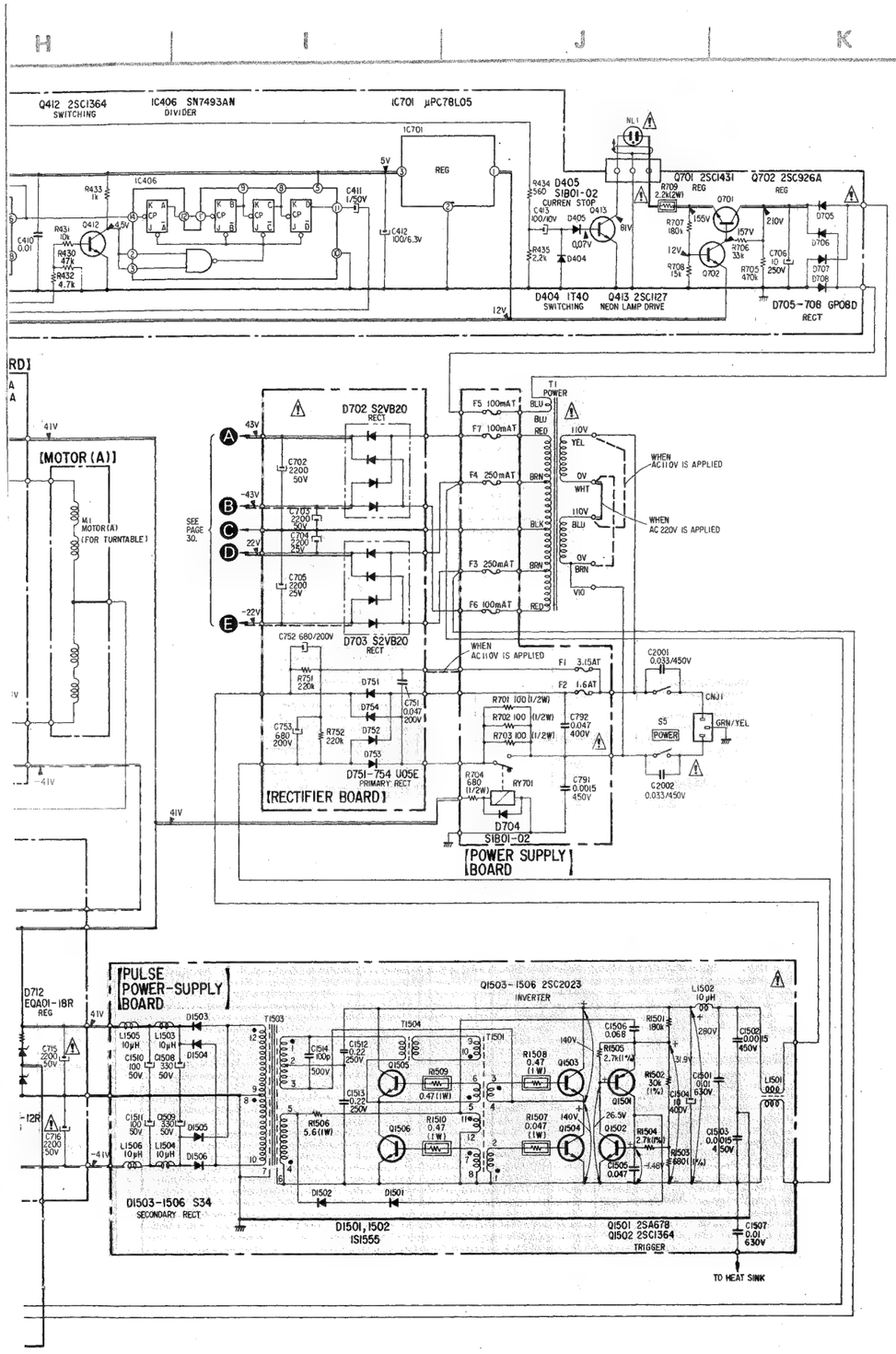
- ○—: parts extracted from the component side.
- ▒▒▒ : B+ pattern
- ▒▒▒ : B- pattern
- Color code of sleeving over the end of the jacket.






IC601
SMOOTHER DC AMP
COMPARATOR
SAWTOOTH WAVE PRODUCE
SHAPER
REG
MOTOR(S) (FOR RETURN) DNF-1001A
M2
SPEED DETECTING HEAD
MGH (MAIN)
MGH (SUB)
[REGULATOR BOARD]
[MOTOR (A)]
M1 MOTOR (A) (FOR TURN TABLE)
BEGINNING OF WINDING
END OF WINDING
A IS LONGER THAN B.
(HOLE DEVICE)
MARKING SIDE
[REMOTE CONTROL UNIT] (RM-90)
CNJ2 REMOTE CONTROL SOCKET
PLUG
[FUNCTION SWITCH BOARD]
[RELAY BOARD]
[PITCH CONTROL BOARD]
WHEN RV751 IS SET AT MECHANICAL MID POSITION, X'TAL LOCK OPERATES.
SHUTTER (AUTO-RETURN DET)
WHEN POWER SWITCH IS TURNED ON
S6 RETURN (ON DURING RETURN OPERATION)
: OFF
: ON
SPEED SELECTOR
REJECT
SYSTEM CONTROL
START STOP
45 INDICATION
33 1/3 INDICATION
I-586 731A
SONY


[SERVO AMP BOARD]
[PITCH CONTROL BOARD]
[DIODE BOARD]
[FUNCTION SWITCH BOARD]
[REGULATOR BOARD]
[MOTOR(A)]
[MOTOR(B)]
[REMOTE CONTROL UNIT(RM90)]
Q401 2SA678 SWITCHING
Q403 2SC1963 DIFFERENTIAL AMP
Q407 2SC1364 SWITCHING
IC401 MSM5811 CRYSTAL OSC, PHASE CONTROL
IC402 SN7493AN DIVIDER
D402,403 1T40 SWITCHING
Q408 2SC1364 SWITCHING
IC403 SN7400N SHAPER
IC404 SN7493AN DIVIDER
Q409,410 2SC1364 MULTIVIBRATOR
Q411 2SC1364 SWITCHING
IC405 SN7400N SHAPER
Q412 2SC1364 SWITCHING
Q402 2SC1364 SWITCHING
Q404 — 406 2SA678 OSC
D401 1T40 SWITCHING
OSC FREQ (33RPM)
OSC FREQ (45RPM)
Q414 2SC1364 SWITCHING
D406 EQA01-05R REG
Q415,416 2SC1364 SPEED CHANGE
Q417,418 2SC1364 SWITCHING
Q419 — 421 2SC1364 SWITCHING
D408 SIB01-02 REG
IC407-1 μPC1458 FILTER AMP
D407 RD3.9E REG
Q422,423 2SC1364 SWITCHING
Q425 2SA678 SWITCHING
Q424 2SC1364 SWITCHING
Q426 2SC1963 COMPARATOR
Q427,428 2SA678 PULSE AMP
Q429 2SC1364 SAMPLE HOLD
Q431 2SC1364 BUFFER AMP
Q430 2SC1364 SWITCHING
Q433 2SA678 SWITCHING
IC407-2 μPC1458 FILTER AMP
D413,414 1T40 SWITCHING
Q432 2SC1364 BUFFER AMP
D409,410 VD122I LIMITER
IC408-1 μPC1458 LIMITER AMP
D411,412 1T40 SWITCHING
Q442 2SC1364 SWITCHING
Q443 2SC1364 SAMPLE HOLD
Q444 2SC1364 BUFFER AMP
Q445 2SC1364 SWITCHING
Q446,447 2SC1364 BRAKE CONTROL
D423,424 1T40 SWITCHING
Q448 2SC1364 SWITCHING
D419,420 VD122I LIMITER
IC408-2 μPC1458 LIMITER AMP
D421,422 1T40 SWITCHING
Q603,604 2SC1364 START/STOP FLIP-FLOP
D601,602 1T40 SWITCHING
Q605 2SC1364 SWITCHING
Q606 2SC1364 SWITCHING
Q607 2SC1061
Q608 2SC1475 BRAKE SOLENOID DRIVE
Q609 — 613 2SC1364 SWITCHING
D603 1T40 SWITCHING
Q601,602 2SC1364 SWITCHING
Q616,617 2SC1364
Q615 2SC1061 LAMP LIGHTING
Q618 2SC1364 RETURN POSITION DET
Q619 2SC1364 SWITCHING
Q620,621 2SC1364 REJECT FLIP-FLOP
Q622 2SC1364 SWITCHING
D614 616 1T40 SWITCHING
D611 — 613 1T40 SWITCHING
D610 EQA01-06R REG
Q626 2SC1364 SWITCHING
D615
D1001 SIB01-02 REVERSE VOLTAGE STOPPER
PM1 BRAKE
SEE PAGE 30.
POWER SWITCH IS TURNED ON
8 SEC
D604 VD122I
D605 RD3.9E REG
D606 VD122I REG
Q614 2SC1364 SWITCHING
D607 EQA01-13 REG
D608,609 SIB01-02 RECT
Q623,624 2SC1364 SWITCHING
Q625 2SC1061 MOTOR DRIVE
IC601 CX065A SERVO AMP
SAWTOOTH WAVE PRODUCE
COMPARATOR
SMOOTHER, DC AMP
SHAPER
IC703 μPC14312H
IC704 FS7912M
H2 5GF-MS-07F HOLE DEVICE
IC409-1 μPC1458 AMP
Q434,439 2SC1509
Q435,438 2SA777 MOTOR DRIVE
D417 1T40 SWITCHING
D415 VD122I REG
H1 5GF-MS-07F HOLE DEVICE
IC409-2 μPC1458 AMP
Q436,441 2SC1509
Q437,440 2SA777 MOTOR DRIVE
D416 VD122I REG
D418 1T40 SWITCHING
IC702 μPC14312H
Q706,708 2SD476A
Q707,709 2SB566A MOTOR DRIVE
Q703,704 2SD476A REG
D709 EQA01-33R REG
D710 EQA01-20R REG
D711 EQA01-33R REG
Q705 2SB566A REG
D712 EQA01-18R REG
D713 EQA01-12R REG
M1 MOTOR(A) (FOR TURNT.
M2 MOTOR(B) (FOR RETURN)
DNF-1001A
S1, 2 SPEED SELECTOR
S2 33V/3
S3 START/STOP
S4 REJECT
S5 X'TAL-LOCK
S6 RETURN (ON DURING RETURN OPERATION)
SYSTEM CONTROL
SPEED DETECTING HEAD MGH (MAIN)
SPEED DETECTING HEAD MGH (SUB)
SHUTTER (AUTO-RETURN DET.)
CNJ 2 REMOTE CONTROL SOCKET
REJECT
START/STOP
D755 SLP24B X'TAL-LOCK INDICATION
D756 D756,757 45 INDICATION SLP24B
D757 33V/3 INDICATION
WHEN RV751 IS SET AT MECHANICAL MID POSITION, X'TAL-LOCK OPERATE
SEE PAGE 30.



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note:

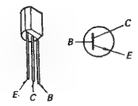
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalum.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ: 1000Ω; MΩ: 1000kΩ
- ▭ : nonflammable resistor.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——— : B+ bus.
- – – – : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20kΩ/V).
  ( ): stop
- Voltage variations may be noted due to normal production tolerances.
- (1%) indicates component tolerance.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Switch

Ref. No.	Switch		Position
S1	45	SPEED	OFF
S2	33 1/3	SELECTOR	OFF
S3	START/STOP	SYSTEM	OFF
S4	REJECT	CONTROL	OFF
S5	POWER		OFF
S6	RETURN		OFF
S7	X'TAL-LOCK		ON

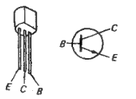
Replacement Semiconductors

For replacement, use semiconductors except in ( ).

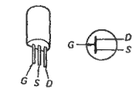
Q101, 201, Q104, 204, Q106, 206, Q109, 209, Q112, 212, Q113, 213, Q304, 306, Q309, 311, Q313, 314: 2SC1775E (2SC1775)



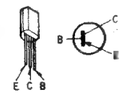
Q102, 202, Q111, 211: 2SC1811



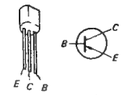
Q103, 203, Q114, 214, Q303, 316: 2SK43-2 (2SK43)
Q308, 321: 2SK43-5 (2SK43)



Q105, 205, Q108, 208, Q110, 210, Q301, 302, Q315, 317, Q320, 322: 2SA872E (2SA872)

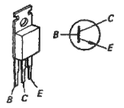


Q115, 215: 2SA896

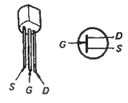


Q107, 207: 2SK97

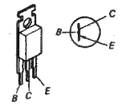
Q305: 2SC1061 (2SC1061C)
Q310: 2SC1173



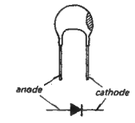
Q307, 312, Q319, 324: 2SK30A



Q318: 2SA671
Q323: 2SA473



D101, 201, D102, 202: VD1221 (VD1221M)

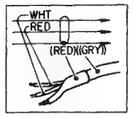


4-3. MOUNTING DIAGRAM (AMP SECTION)

— Conductor Side —

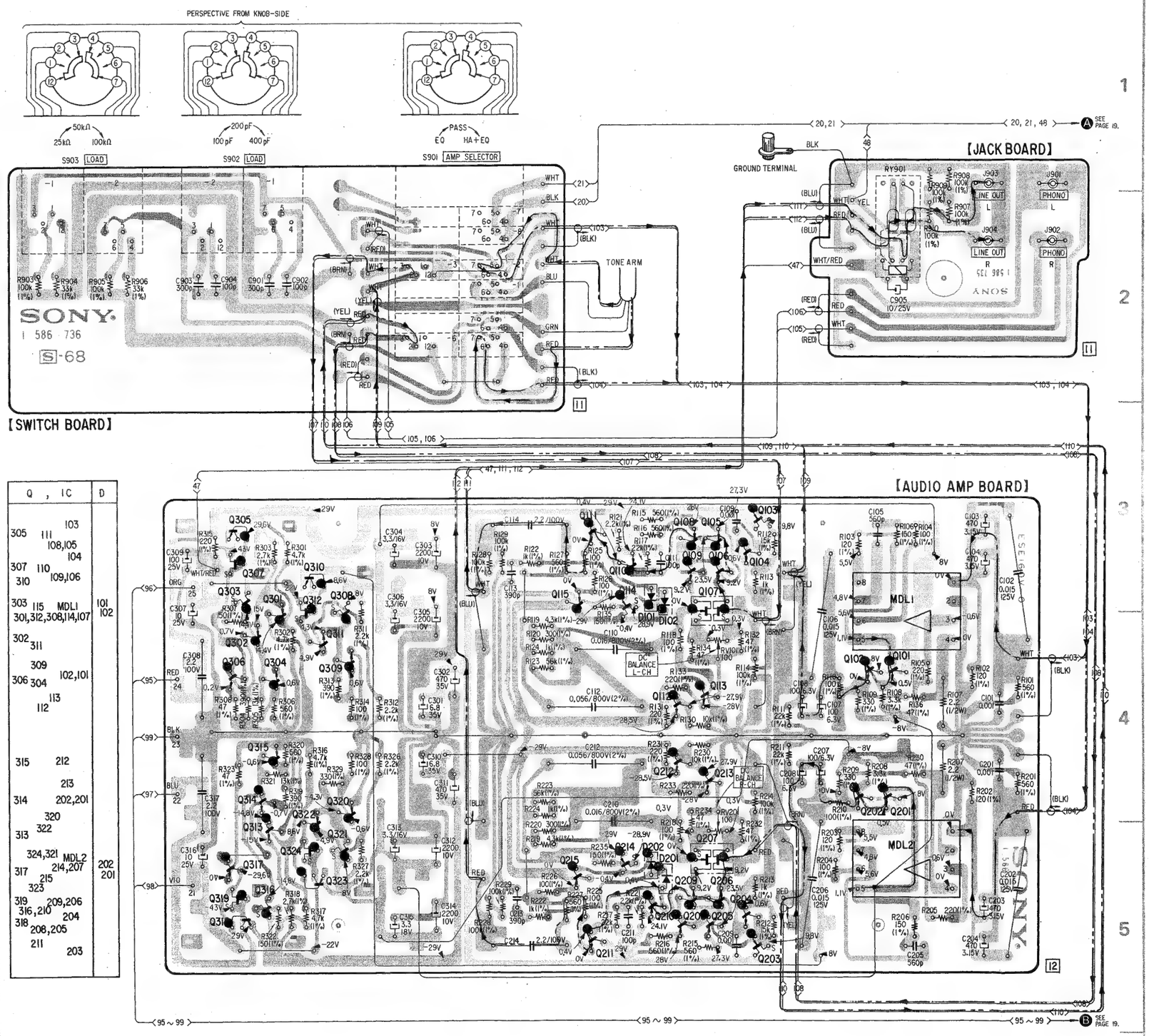
Replacement Semiconductors:
See page 26.

Note: For Mounting Diagram
- ○—: parts extracted from the component side.
- ▨ : B+ pattern
- ▨ : B– pattern
- ▬▶ : signal path
- ▬▶ : L-CH signal path
- ▬▶ : R-CH signal path
- Color code of sleeving over the end of the jacket.

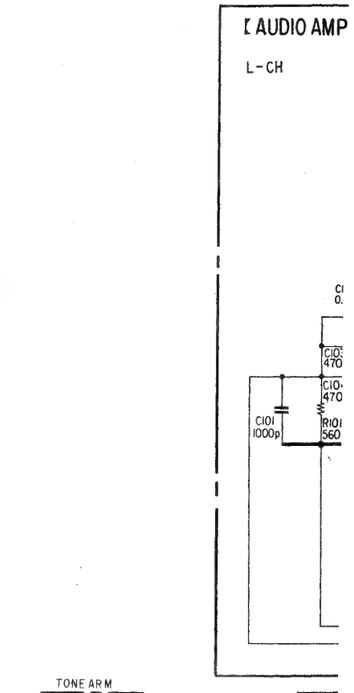


Note: For Schematic Diagram
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalum.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ: 1000Ω; MΩ: 1000 kΩ
- □ : panel designation.
- □ : adjustment for repair.
- ——— : B+ bus.
- – – – : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- 1% indicates component tolerance.
- All adjustable resistors have characteristic curve B, unless otherwise noted.
- Switch

Ref. No.	Switch	Position
S901-1 to 8	AMP SELECTOR	EQ
S902-1, 2	LOAD	100pF
S903-1, 2	LOAD	25 kΩ



Q , IC	D
103	
305 111 108,105 104	
307 110 109,106	
310	
303 115 MDL1 301,312,308,114,107	101 102
302 311	
309	
306 304 102,101	
113 112	
315 212	
213	
314 202,201	
320 322	
313	
324,321 MDL2 214,207	202 201
317 215 323	
319 209,206 316,210 204	
318 208,205	
211 203	



PS-X9

DIAGRAM (AMP SECTION)

B C D E F G H I

1 2 3 4 5

【AUDIO AMP BOARD】

L-CH

MDL1 AMP — Q101 2SC1775 Q102 2SC1811 BUFFER AMP — HEAD AMP

Q103 2SK43 CURRENT REG
Q104 2SC1775 REG
Q112,113 2SC1775 CURRENT MIRROR
Q105,108 2SA872 CURRENT MIRROR
Q106,109 2SC1775 CASCODE AMP
Q107 2SK97 EQ PREAMP
Q110 2SA872 EQ 2nd AMP
Q114 2SK43 CURRENT REG
D101,102 VD122IM REG
Q111 2SC1811 — EQ AMP OUT — EQ AMP

Q301,302 2SA872 DIFFERENTIAL AMP
Q303 2SK43 CURRENT REG
Q305 2SC1061C REG
Q307 2SK30A CURRENT REG
Q308 2SK43 CURRENT REG
Q310 2SC1173 REG
Q312 2SK30A CURRENT REG
Q304 2SC1775 REG
Q306 2SC1775 DET-AMP
Q309 2SC1775 REG
Q311 2SC1775 DET-AMP
VOLTAGE REGULATOR

Q313,314 2SC1775 DIFFERENTIAL AMP
Q315 2SA872 REG
Q317 2SA872 DET-AMP
Q319 2SK30A CURRENT REG
Q316 2SK43 CURRENT REG
Q318 2SA671 REG
VOLTAGE REGULATOR

Q320 2SA872 REG
Q322 2SA872 DET-AMP
Q324 2SK30A CURRENT REG
Q321 2SK43 CURRENT REG
Q323 2SA473 REG

【JACK BOARD】

S901 AMP SELECTOR

J901 PHONO L
J902 PHONO R
J903 LINE OUT L
J904 LINE OUT R
RY901
S902,903 LOAD

R-CH

R-CH (SAME AS L-CH. REF NO. FROM 201)

SEE PAGE 23-25

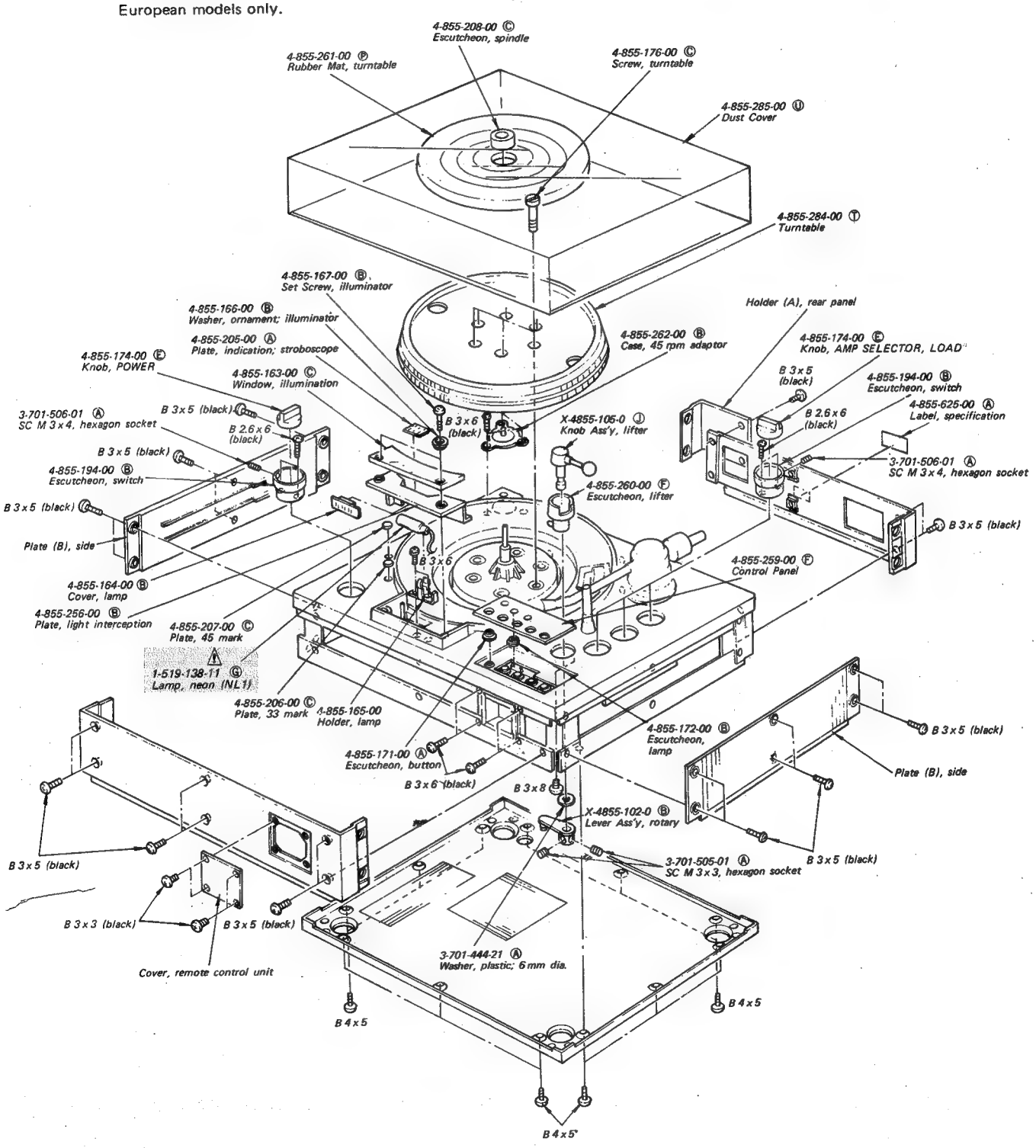
SECTION 5
EXPLODED VIEWS

A | B | C | D

1 | 2 | 3 | 4 | 5

5-1. Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

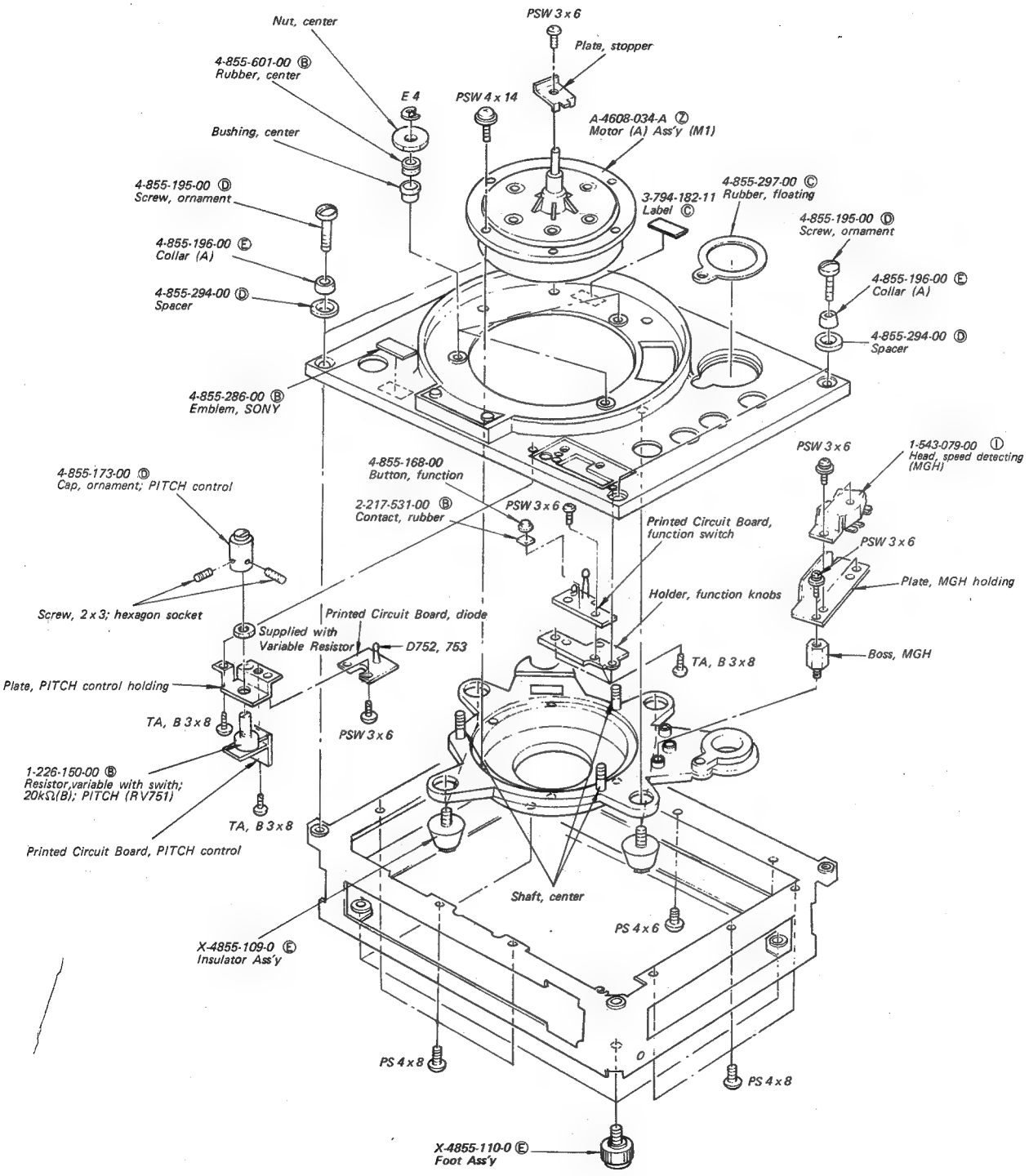


A B C D

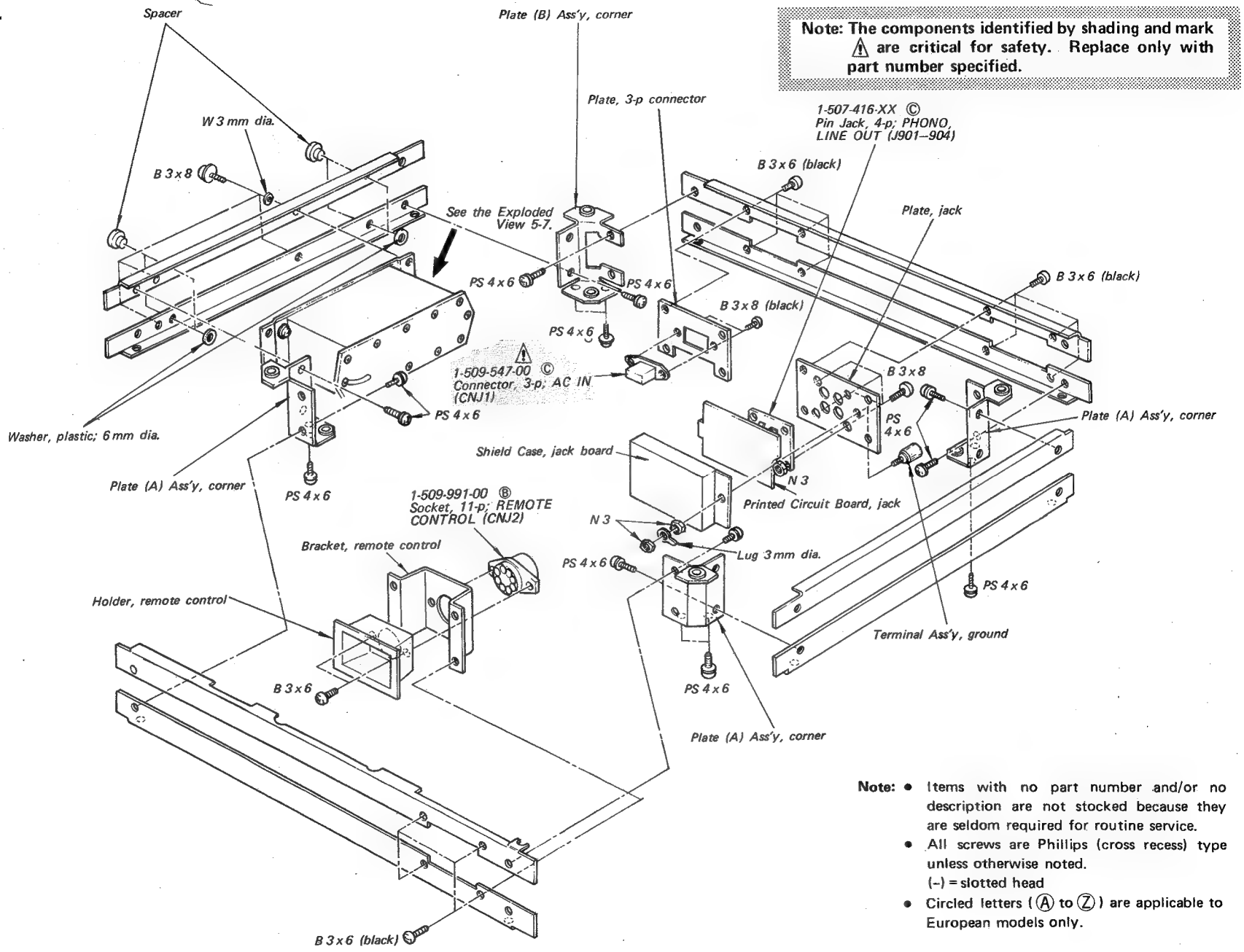
1 2 3 4 5

5-2.

Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



5-3.



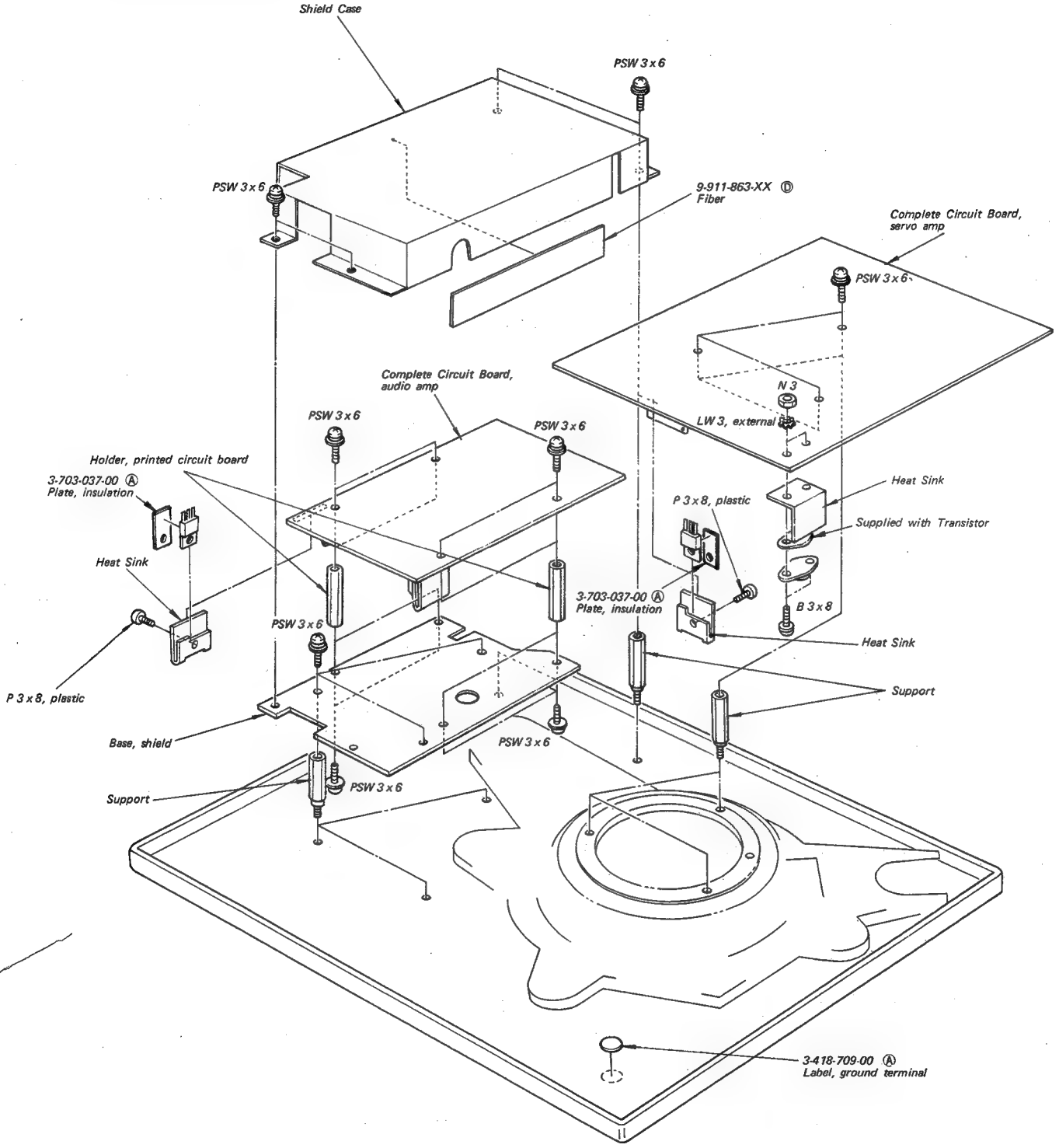
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

A B C D

5-4.

Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



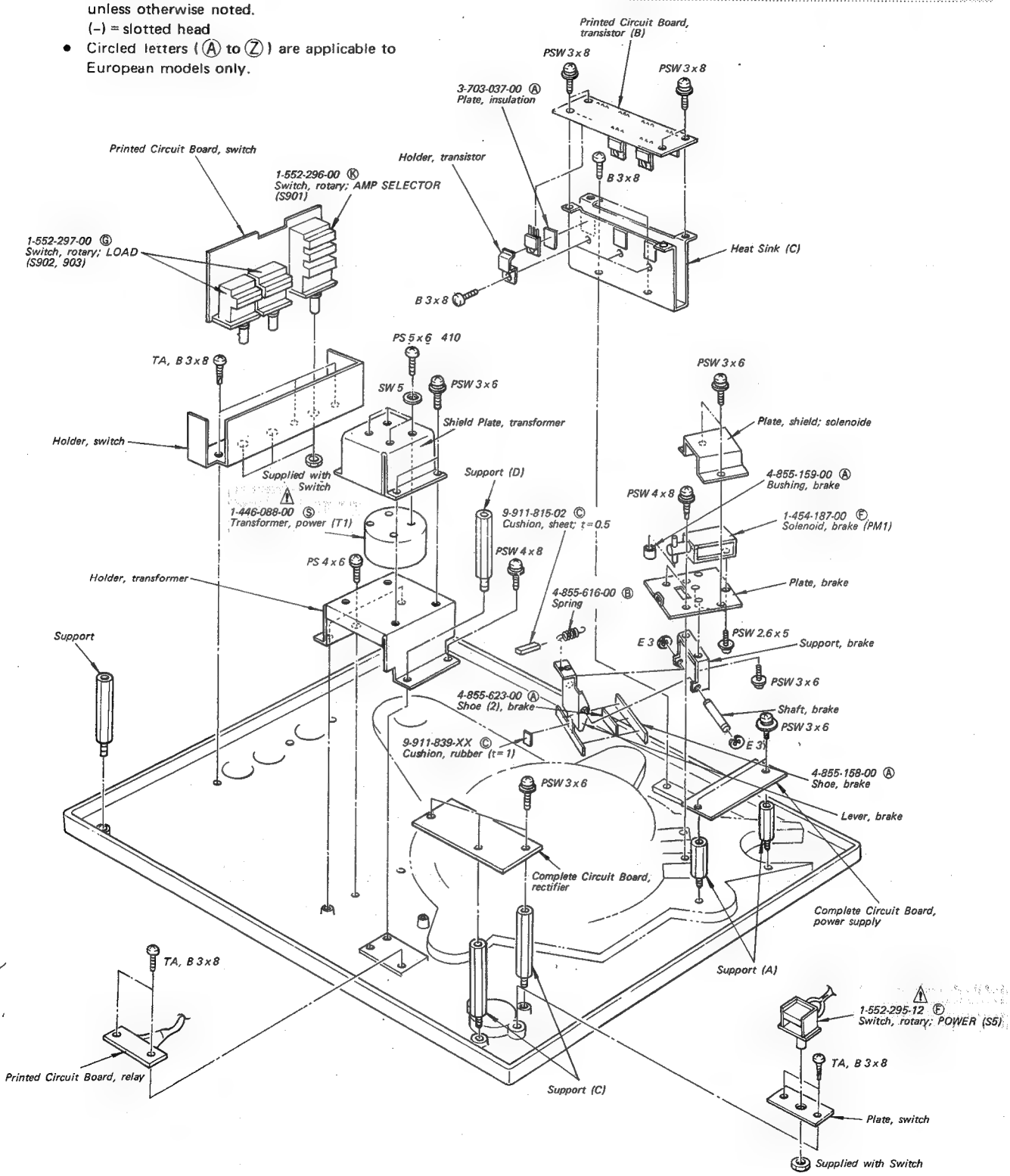
A B C D

1 2 3 4 5

5-5.

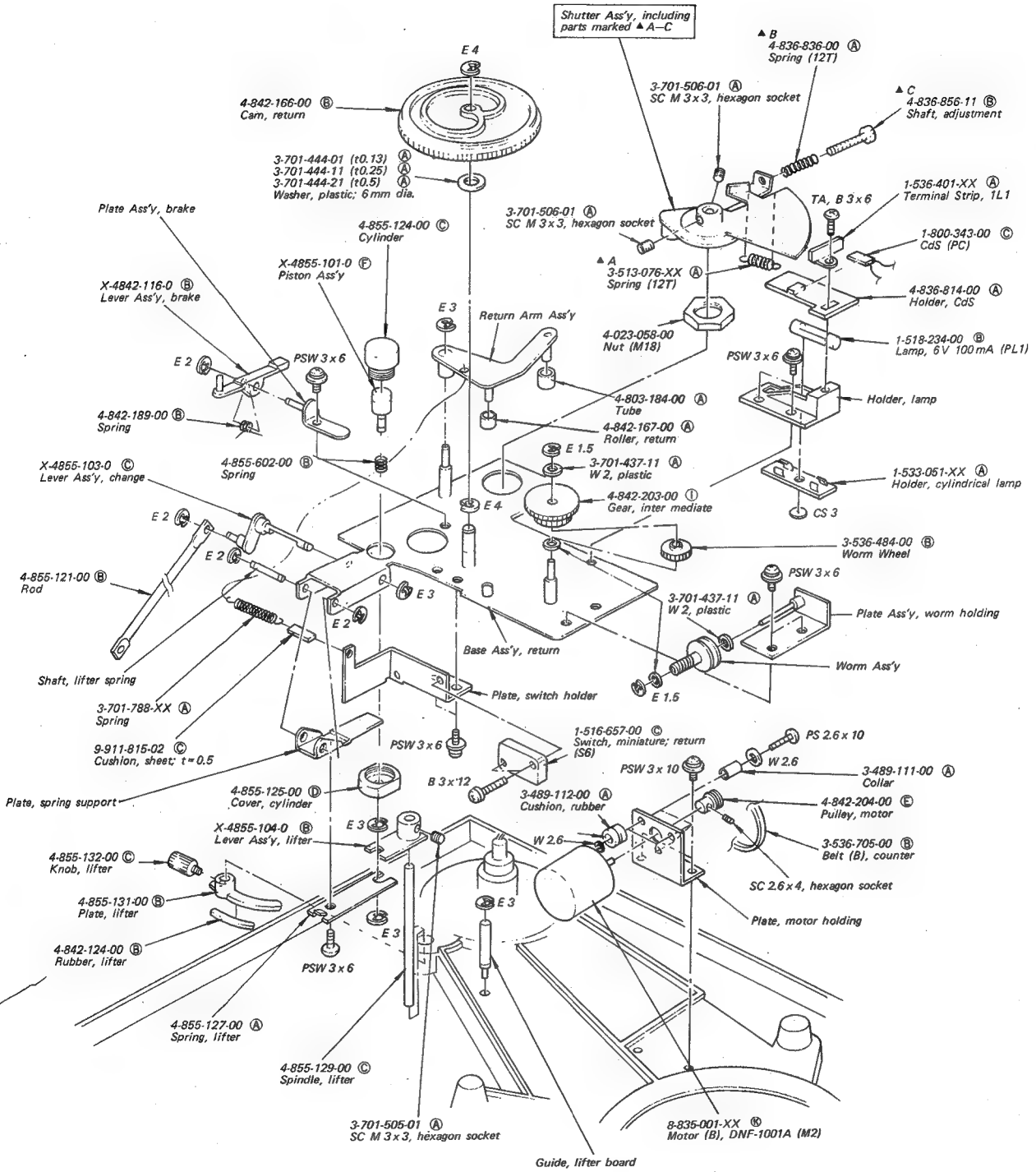
Note: • Items with no part number and/or no description are not stocked because they are seldom required for routine service.
• All screws are Phillips (cross recess) type unless otherwise noted.
(–) = slotted head
• Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



5-6.

Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

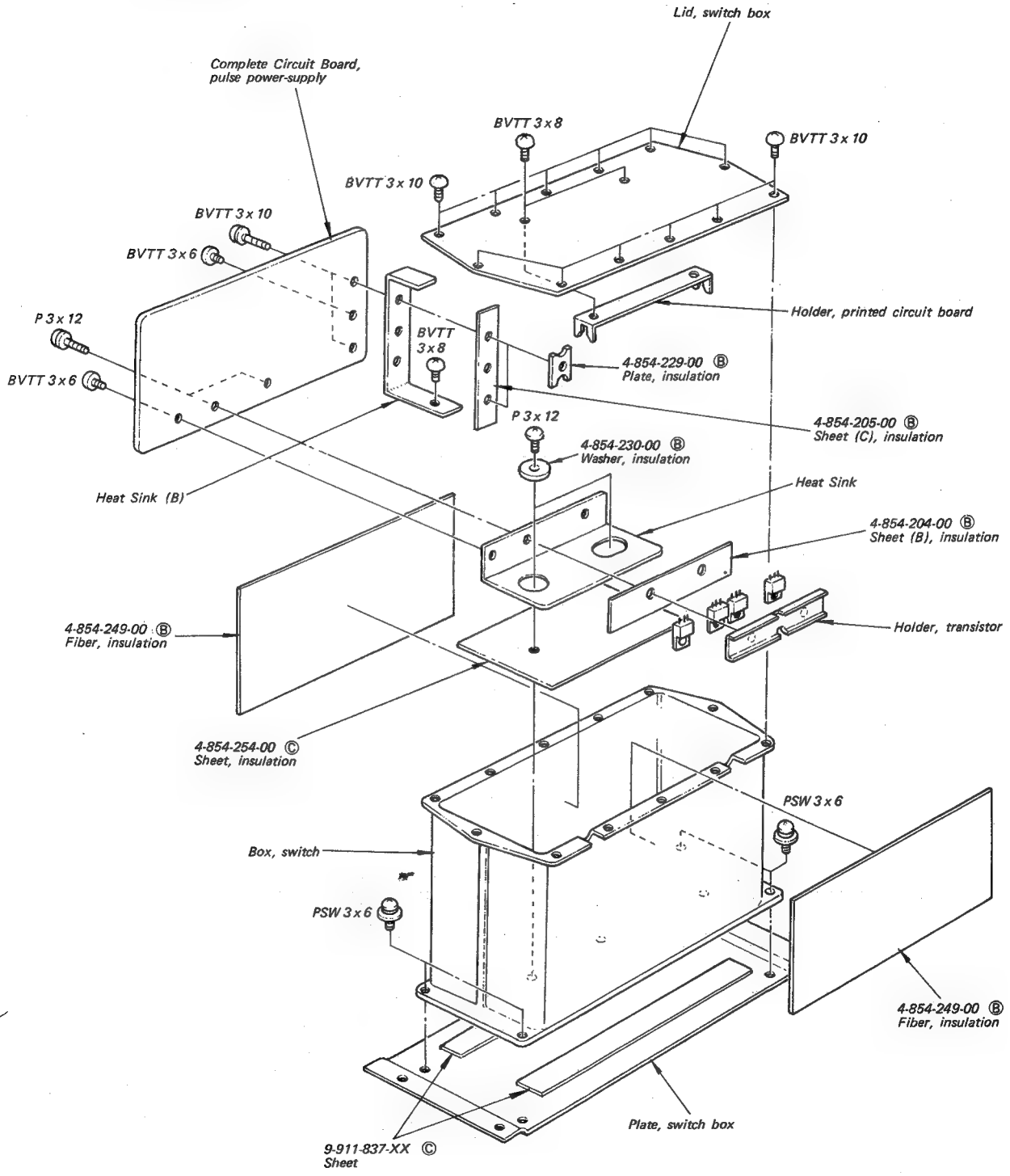


A B C D

1 2 3 4 5

5-7.

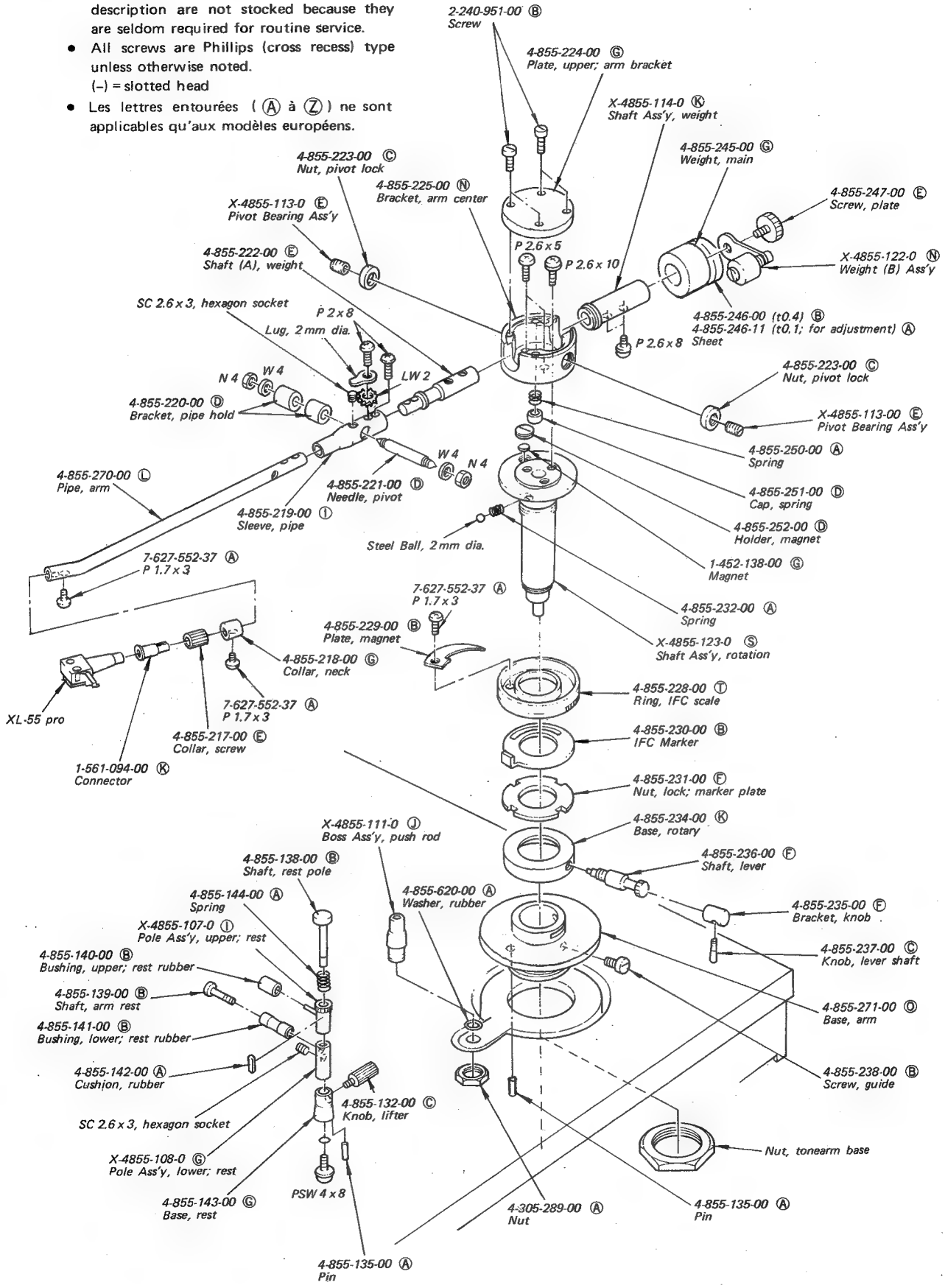
Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Les lettres entourées (Ⓐ à Ⓩ) ne sont applicables qu'aux modèles européens.



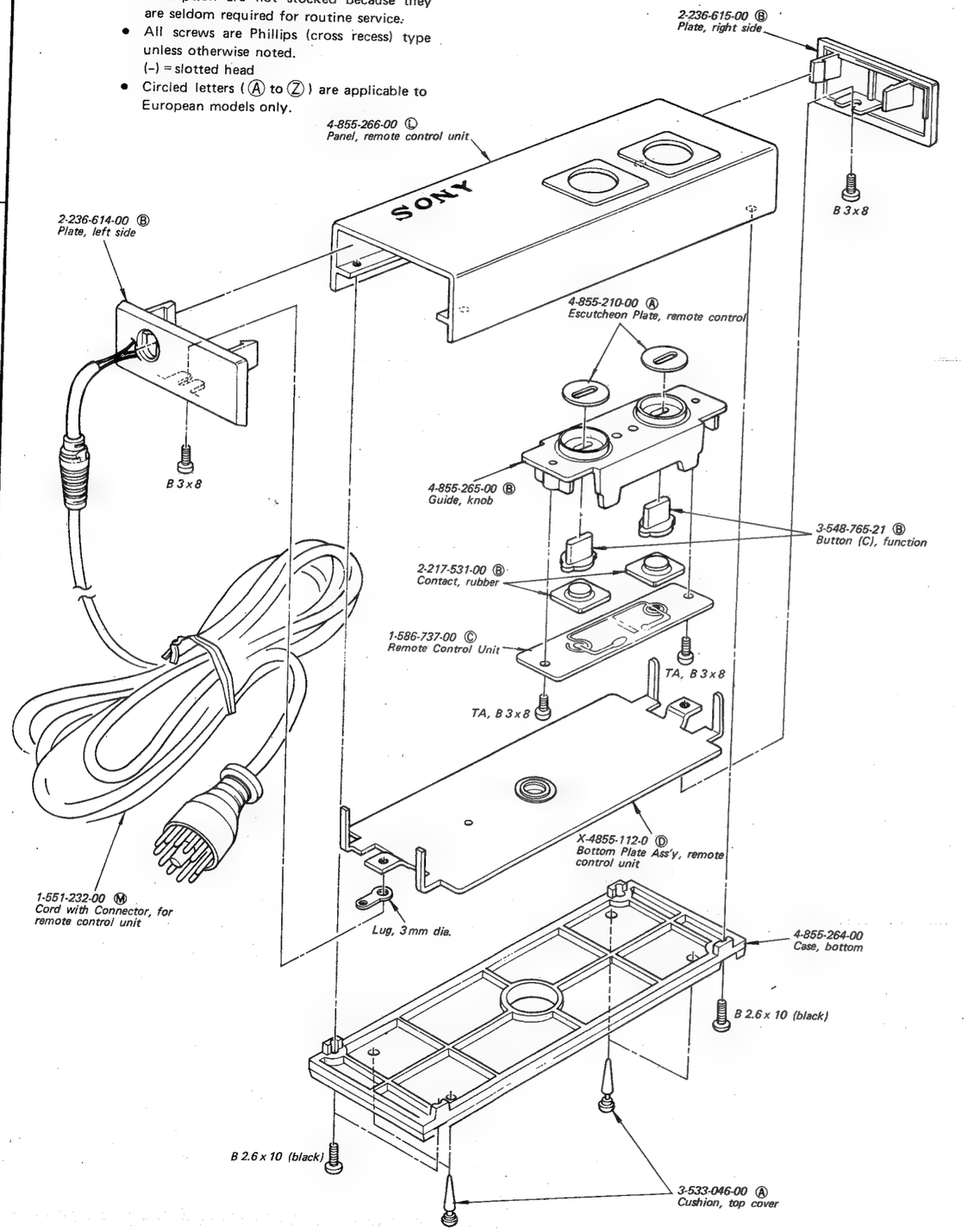
A B C D

5-8.

Note: • Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Les lettres entourées (Ⓐ à Ⓩ) ne sont applicables qu'aux modèles européens.



5-9. **Note:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



SECTION 6
ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*	*Description*
		SEMICONDUCTORS
		Transistors
⇒ Q101,201	8-729-377-58	Ⓑ 2SC1775E
Q102,202	8-765-012-20	Ⓑ 2SC1811
⇒ Q103,203	8-723-302-00	Ⓓ 2SK43-2
⇒ Q104,204	8-729-377-58	Ⓑ 2SC1775E
⇒ Q105,205	8-729-387-28	Ⓑ 2SA872E
⇒ Q106,206	8-729-377-58	Ⓑ 2SC1775E
Q107,207	8-765-342-10	Ⓕ 2SK97
⇒ Q108,208	8-729-387-28	Ⓑ 2SA872E
⇒ Q109,209	8-729-377-58	Ⓑ 2SC1775E
⇒ Q110,210	8-729-387-28	Ⓑ 2SA872E
Q111,211	8-765-012-20	Ⓒ 2SC1811
⇒ Q112,212 ⇒ Q113,213	8-729-377-58	Ⓑ 2SC1775E
⇒ Q114,214	8-723-302-00	Ⓓ 2SK43-2
Q115,215	8-765-082-20	Ⓒ 2SA896
⇒ Q301,302	8-729-387-28	Ⓑ 2SA872E
⇒ Q303	8-723-302-00	Ⓓ 2SK43-2
⇒ Q304	8-729-377-58	Ⓑ 2SC1775E
⇒ Q305	8-729-316-12	Ⓓ 2SC1061
⇒ Q306	8-729-377-58	Ⓑ 2SC1775E
Q307	8-729-203-04	Ⓑ 2SK30A
⇒ Q308	8-723-305-00	Ⓑ 2SK43-5
⇒ Q309	8-729-377-58	Ⓑ 2SC1775E
Q310	8-729-217-33	Ⓓ 2SC1173
⇒ Q311	8-729-377-58	Ⓒ 2SC1775E
Q312	8-729-203-04	Ⓑ 2SK30A
⇒ Q313,314	8-729-377-58	Ⓓ 2SC1775E
⇒ Q315	8-729-387-28	Ⓑ 2SC872E
⇒ Q316	8-723-302-00	Ⓓ 2SK43-2
⇒ Q317	8-729-387-28	Ⓑ 2SA872E
Q318	8-729-317-12	Ⓔ 2SA671
Q319	8-729-203-04	Ⓑ 2SK30A
⇒ Q320	8-729-387-28	Ⓑ 2SA872E
⇒ Q321	8-723-305-00	Ⓑ 2SK43-5
⇒ Q322	8-729-387-28	Ⓑ 2SA872E
Q323	8-729-247-33	Ⓒ 2SA473

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Ref. No.	*Part No.*	*Description*
Q324	8-729-203-04	Ⓑ 2SK30A
⇒ Q401	8-729-389-37	Ⓑ 2SA893
Q402	8-729-633-47	Ⓓ 2SC1364
Q403	8-765-222-20	Ⓓ 2SC1963
⇒ Q404–406	8-729-389-37	Ⓑ 2SA893
Q407–412	8-729-633-47	Ⓓ 2SC1364
⇒ Q413	8-729-322-78	Ⓒ 2SC2278
Q414–424	8-729-663-47	Ⓓ 2SC1364
⇒ Q425	8-729-389-37	Ⓑ 2SA893
Q426	8-765-222-20	Ⓓ 2SC1963
⇒ Q427,428	8-729-389-37	Ⓑ 2SA893
Q429–432	8-729-663-47	Ⓓ 2SC1364
⇒ Q433	8-729-389-37	Ⓑ 2SA893
Q434	8-729-450-93	Ⓑ 2SC1509
Q435	8-729-477-73	Ⓒ 2SA777
Q436	8-729-450-93	Ⓑ 2SC1509
Q437,438	8-729-477-73	Ⓒ 2SA777
Q439	8-729-450-93	Ⓑ 2SC1509
Q440	8-729-477-73	Ⓒ 2SA777
Q441	8-729-450-93	Ⓑ 2SC1509
Q442–448	8-729-663-47	Ⓑ 2SC1364
Q601–606	8-729-663-47	Ⓑ 2SC1364
Q607	8-729-316-12	Ⓓ 2SC1061
Q608	8-760-413-10	Ⓒ 2SC1475
Q609–614	8-729-663-47	Ⓓ 2SC1364
Q615	8-729-316-12	Ⓓ 2SC1061
Q616–624	8-729-663-47	Ⓑ 2SC1364
Q625	8-729-316-12	Ⓓ 2SC1061
Q626	8-729-663-47	Ⓑ 2SC1364
Q701	8-760-122-01	Ⓔ 2SC1431
Q702	8-720-950-03	Ⓒ 2SC926A
Q703,704	8-729-307-62	Ⓓ 2SD476A
Q705	8-729-306-62	Ⓔ 2SB566A
Q706	8-729-307-62	Ⓓ 2SD476A
Q707	8-729-306-62	Ⓔ 2SB566A
Q708	8-729-307-62	Ⓓ 2SD476A
Q709	8-729-306-62	Ⓔ 2SB566A

Ref. No.	Part No.		Description
⇒Q1501	⚠8-729-389-37	Ⓑ	2SA893
Q1502	⚠8-729-633-47	Ⓓ	2SC1364
⇒Q1503 – ⇒Q1506	⚠8-729-302-31	Ⓔ	2SC2023-R
H1,2	8-719-905-07	Ⓓ	5GF-MS-07F
	Diodes		
⇒D101,201, ⇒D102,202	8-719-122-10	Ⓐ	VD1221
⇒D401–404	8-719-815-55	Ⓑ	1S1555
⇒D405	8-719-200-02	Ⓑ	10E2
⇒D406	8-719-931-05	Ⓑ	EQB01-05
D407	8-719-139-07	Ⓑ	RD3.9E
⇒D408	8-719-200-02	Ⓑ	10E2
D409,410	8-719-122-10	Ⓐ	VD1221
⇒D411–414	8-719-815-55	Ⓑ	1S1555
D415,416	8-719-122-10	Ⓐ	VD1221
⇒D417,418	8-729-815-55	Ⓑ	1S1555
D419,420	8-719-122-10	Ⓐ	VD1221
⇒D421–424	8-719-815-55	Ⓑ	1S1555
⇒D601–603	8-719-815-55	Ⓑ	1S1555
D604	8-719-122-10	Ⓐ	VD1221
D605	8-719-139-07	Ⓑ	RD3.9E
D606	8-719-122-10	Ⓐ	VD1221
⇒D607	8-719-931-13	Ⓑ	EQB01-13
⇒D608,609	8-719-200-02	Ⓑ	10E2
⇒D610	8-719-931-06	Ⓑ	EQB01-06
⇒D611–616	8-719-815-55	Ⓑ	1S1555
D702,703	⚠8-719-502-20	Ⓒ	S2VB20
⇒D704	8-719-200-02	Ⓑ	10E2
⇒D705–708	⚠8-719-200-02	Ⓑ	10E2
⇒D709	8-719-931-33	Ⓑ	EQB01-33
⇒D710	8-719-931-20	Ⓑ	EQB01-20
⇒D711	8-719-931-33	Ⓑ	EQB01-33
⇒D712	8-719-931-18	Ⓑ	EQB01-18
⇒D713	8-719-930-12	Ⓑ	EQB01-12Z
⇒D751–754	⚠8-719-911-55	Ⓑ	U05G
D755–757	8-719-900-24	Ⓒ	SLP24B
⇒D1001	8-719-200-02	Ⓑ	10E2
D1501, D1502	⚠8-719-815-55	Ⓑ	1S1555

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.		Description
D1503 – D1506	⚠8-719-303-41	Ⓒ	S34
	ICs		
IC401	8-759-958-11	Ⓛ	MSM5811
⇒IC402	8-759-632-93	Ⓚ	M53293P
⇒IC403	8-759-632-00	Ⓔ	M53200P
⇒IC404	8-759-632-93	Ⓚ	M53293P
⇒IC405	8-759-632-00	Ⓔ	M53200P
⇒IC406	8-759-632-93	Ⓚ	M53293P
⇒IC407–409	8-759-114-58	Ⓔ	μPC1458C
IC601	8-759-600-65	Ⓕ	CX065A
IC701	8-759-178-05	Ⓒ	μPC78L05
IC702,703	8-759-143-12	Ⓕ	μPC14312H
IC704	8-759-379-12	Ⓘ	FS7912M
	COILS		
L1501	⚠1-421-340-00	Ⓔ	Choke, line filter
L1502 – L1506	⚠1-421-329-00	Ⓑ	Choke, 10μH
	TRANSFORMERS AND FILTER		
T1	⚠1-446-088-00	Ⓢ	Power
T1501	⚠1-433-197-11	Ⓕ	OSC
T1503	⚠1-446-087-00	Ⓚ	Converter
T1504	⚠1-543-129-00	Ⓐ	Core

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.
50WV or less are not indicated except for electrolytics. p: μμF, elect = electrolytic

C101,201	1-102-074-00	Ⓐ	1000p		
C102,202	1-104-129-00	Ⓒ	0.015	125V	styrol
C103,203, C104,204	1-131-429-00	Ⓕ	470	3.15V	tantalum
C105,205	1-102-115-00	Ⓐ	560p		
C106,206	1-104-129-00	Ⓒ	0.015	125V	styrol
C107,207, C108,208	1-131-295-00	Ⓒ	100	6.3V	tantalum
C109,209	1-102-074-00	Ⓐ	1000p		
C110,210	1-130-145-00	Ⓑ	0.016	800V	polyethylene (2%)
C111,211	1-102-973-00	Ⓐ	100p		
C112,212	1-130-146-00	Ⓒ	0.056	800V	polyethylene (2%)
C113,213	1-102-822-00	Ⓐ	390p		
C114,214	1-130-084-00	Ⓓ	2.2	100V	polyethylene
C301	1-131-239-00	Ⓑ	6.8	35V	tantalum
C302	1-121-941-00	Ⓑ	470	35V	elect
C303	1-123-074-00	Ⓐ	2200	10V	elect
C304	1-131-449-00	Ⓒ	3.3	16V	tantalum
C305	1-123-074-00	Ⓐ	2200	10V	elect
C306	1-131-449-00	Ⓒ	3.3	16V	tantalum
C307	1-123-187-00	Ⓐ	10	25V	elect
C308	1-130-084-00	Ⓓ	2.2	100V	polyethylene
C309	1-121-935-00	Ⓑ	100	25V	elect
C310	1-131-239-00	Ⓑ	6.8	35V	tantalum
C311	1-121-941-00	Ⓑ	470	35V	elect
C312	1-123-074-00	Ⓐ	2200	10V	elect
C313	1-131-449-00	Ⓒ	3.3	16V	tantalum
C314	1-123-074-00	Ⓐ	2200	10V	elect
C315	1-131-449-00	Ⓒ	3.3	16V	tantalum
C316	1-123-187-00	Ⓐ	10	25V	elect
C317	1-130-084-00	Ⓓ	2.2	100V	polyethylene
C401	1-130-140-00	Ⓑ	0.039	100V	polyethylene
C402	1-108-800-00	Ⓐ	0.0047		mylar
C403,404	1-102-491-00	Ⓐ	51p		
C405–407	1-101-923-00	Ⓐ	0.01		
C408,409	1-131-295-00	Ⓒ	100	6.3V	tantalum
C410	1-101-923-00	Ⓐ	0.01		
C411	1-121-391-00	Ⓐ	1	50V	elect
C412	1-123-197-00	Ⓐ	100	6.3V	elect
C413	1-123-196-00	Ⓐ	100	10V	elect
C414	1-121-391-00	Ⓐ	1	50V	elect
C415	1-123-228-00	Ⓑ	1	50V	elect
C416	1-108-804-00	Ⓐ	0.01		mylar
C417	1-131-218-00	Ⓑ	3.3	35V	elect

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.		Description		
C418	1-108-808-00	Ⓐ	0.022		mylar
C419	1-123-192-00	Ⓐ	47	16V	elect
C420,421	1-108-804-00	Ⓐ	0.01		mylar
C422	1-130-140-00	Ⓑ	0.039	100V	polyethylene
C423	1-108-816-00	Ⓑ	0.1		mylar
C424	1-108-804-00	Ⓐ	0.01		mylar
C425	1-123-021-00	Ⓑ	0.47	50V	elect (nonpolarized)
C426	1-108-812-00	Ⓐ	0.047		mylar
C427	1-108-816-00	Ⓑ	0.1		mylar
C428,429	1-123-228-00	Ⓑ	1	50V	elect
C430	1-108-808-00	Ⓐ	0.022		mylar
C431	1-123-192-00	Ⓐ	47	16V	elect
C432	1-108-804-00	Ⓐ	0.01		mylar
C433	1-108-803-00	Ⓐ	0.0082		mylar
C435	1-121-935-00	Ⓑ	100	25V	elect
C1501	⚠1-130-141-00	Ⓐ	0.01	630V	polyethylene
C1502,1503	⚠1-115-149-00	Ⓒ	0.0015	450V	paper
C1504	⚠1-123-290-00	Ⓑ	10	400V	elect
C1505	⚠1-108-595-00	Ⓐ	0.047		mylar
C1506	⚠1-108-599-00	Ⓐ	0.068		mylar
C1507	⚠1-130-141-00	Ⓐ	0.01	630V	polyethylene
C1508,1509	⚠1-121-656-00	Ⓑ	330	50V	elect
C1510,1511	⚠1-121-417-00	Ⓑ	100	50V	elect
C1512,1513	⚠1-108-969-00	Ⓑ	0.22	250V	film
C1514	⚠1-102-973-00	Ⓐ	100p	500V	mica
C601	1-101-918-00	Ⓐ	1000p		
C602	1-131-212-00	Ⓑ	0.33	35V	tantalum
C603,604	1-123-021-00	Ⓑ	0.47	50V	elect (nonpolarized)
C605	1-121-391-00	Ⓐ	1	50V	elect
C606	1-123-228-00	Ⓑ	1	50V	elect
C607	1-123-189-00	Ⓐ	33	25V	elect
C608	1-121-981-00	Ⓑ	220	6.3V	elect
C609	1-121-391-00	Ⓐ	1	50V	elect
C610	1-123-044-00	Ⓑ	33	25V	elect
C611	1-121-392-00	Ⓐ	3.3	25V	elect
C612–614	1-121-391-00	Ⓐ	1	50V	elect
C615	1-121-651-00	Ⓐ	10	16V	elect
C616	1-131-211-00	Ⓑ	0.22	35V	tantalum
C617	1-123-193-00	Ⓐ	100	16V	elect

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

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Ref. No.	Part No.				
C618	1-121-935-00	Ⓑ	100	25V	elect
C619	1-123-187-00	Ⓐ	10	25V	elect
C620,621	1-121-935-00	Ⓑ	100	25V	elect
C622	1-108-810-00	Ⓐ	0.033	100V	mylar
C623	1-101-918-00	Ⓐ	1000p		
C702,703	⚠1-125-136-00	Ⓔ	2200	50V	elect
C704,705	⚠1-123-067-00	Ⓐ	2200	25V	elect
C706	⚠1-123-254-00	Ⓑ	10	250V	elect
C707–709	1-123-183-00	Ⓐ	10	50V	elect
C710	1-123-059-00	Ⓑ	100	50V	elect
C711	1-123-228-00	Ⓑ	1	50V	elect
C712	1-121-935-00	Ⓑ	100	25V	elect
C713	1-123-059-00	Ⓑ	100	50V	elect
C714	1-123-228-00	Ⓑ	1	50V	elect
C715,716	⚠1-125-136-00	Ⓔ	2200	50V	elect
C751	⚠1-129-773-00	Ⓐ	0.047	200V	polyethyiene
C752,753	⚠1-123-291-00	Ⓖ	680	200V	elect
C791	⚠1-115-149-00	Ⓒ	0.0015	450V	paper
C792	⚠1-129-755-00	Ⓑ	0.047	400V	polyethylene
C901	1-102-981-00	Ⓐ	300p		
C902	1-102-973-00	Ⓐ	100p		
C903	1-102-981-00	Ⓐ	300p		
C904	1-102-973-00	Ⓐ	100p		
C905	1-123-187-00	Ⓐ	10	25V	elect
C2001,2002	⚠1-115-147-00	Ⓒ	0.033	450V	paper

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted.
Refer to the list on the last page for their part numbers.
All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
kΩ: 1000Ω

Ref. No.	Part No.				
R101,201	1-214-126-00	Ⓐ	560	¼W	metal oxide (1%)
R102,202, R103,203	1-214-110-00	Ⓐ	120	¼W	metal oxide (1%)
R104,204	1-214-108-00	Ⓐ	100	¼W	metal oxide (1%)
R105,205	1-214-116-00	Ⓐ	220	¼W	metal oxide (1%)
R106,206	1-214-112-00	Ⓐ	150	¼W	metal oxide (1%)
R107,207	1-244-809-00	Ⓐ	2.2	½W	carbon
R108,208	1-214-144-00	Ⓐ	3.3 k	¼W	metal oxide (1%)
R109,209	1-214-120-00	Ⓐ	330	¼W	metal oxide (1%)
R110,210	1-214-108-00	Ⓐ	100	¼W	metal oxide (1%)
R111,211	1-214-164-00	Ⓐ	22 k	¼W	metal oxide (1%)
R112,212	1-214-160-00	Ⓐ	15 k	¼W	metal oxide (1%)
R113,213	1-214-132-00	Ⓐ	1 k	¼W	metal oxide (1%)
R114,214	1-214-180-00	Ⓐ	100 k	¼W	metal oxide (1%)
R115,215, R116,216	1-214-126-00	Ⓐ	560	¼W	metal oxide (1%)
R117,217	1-214-164-00	Ⓐ	22 k	¼W	metal oxide (1%)
R118,218	1-214-108-00	Ⓐ	100	¼W	metal oxide (1%)
R119,219	1-214-147-00	Ⓐ	4.3 k	¼W	metal oxide (1%)
R120,220	1-214-119-00	Ⓐ	300	¼W	metal oxide (1%)
R121,221	1-214-140-00	Ⓐ	2.2 k	¼W	metal oxide (1%)
R122,222	1-214-132-00	Ⓐ	1 k	¼W	metal oxide (1%)
R123,223	1-214-174-00	Ⓐ	56 k	¼W	metal oxide (1%)
R124,224	1-214-132-00	Ⓐ	1 k	¼W	metal oxide (1%)
R125,225, R126,226	1-214-108-00	Ⓐ	100	¼W	metal oxide (1%)
R127,227	1-214-126-00	Ⓐ	560	¼W	metal oxide (1%)
R128,228, R129,229	1-214-180-00	Ⓐ	100 k	¼W	metal oxide (1%)
R130,230	1-214-156-00	Ⓐ	10 k	¼W	metal oxide (1%)
R131,231	1-214-116-00	Ⓐ	220	¼W	metal oxide (1%)
R132,232	1-214-100-00	Ⓐ	47	¼W	metal oxide (1%)
R133,233	1-214-116-00	Ⓐ	220	¼W	metal oxide (1%)
R134,234	1-214-100-00	Ⓐ	47	¼W	metal oxide (1%)
R135,235	1-214-112-00	Ⓐ	150	¼W	metal oxide (1%)
R301,302	1-214-148-00	Ⓐ	4.7 k	¼W	metal oxide (1%)
R303	1-214-142-00	Ⓐ	2.7 k	¼W	metal oxide (1%)
R304	1-214-122-00	Ⓐ	390	¼W	metal oxide (1%)
R305	1-214-159-00	Ⓐ	13 k	¼W	metal oxide (1%)
R306	1-214-126-00	Ⓐ	560	¼W	metal oxide (1%)
R307	1-214-112-00	Ⓐ	150	¼W	metal oxide (1%)
R308	1-214-100-00	Ⓐ	47	¼W	metal oxide (1%)
R311,312	1-214-140-00	Ⓐ	2.2 k	¼W	metal oxide (1%)
R313	1-214-122-00	Ⓐ	390	¼W	metal oxide (1%)
R314	1-214-108-00	Ⓐ	100	¼W	metal oxide (1%)
R315	1-214-116-00	Ⓐ	220	¼W	metal oxide (1%)
R316,317	1-214-148-00	Ⓐ	4.7 k	¼W	metal oxide (1%)
R318	1-214-142-00	Ⓐ	2.7 k	¼W	metal oxide (1%)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*		*Description*		
R319	1-214-122-00	Ⓐ	390	¼W	metal oxide (1%)
R320	1-214-126-00	Ⓐ	560	¼W	metal oxide (1%)
R321	1-214-159-00	Ⓐ	13 k	¼W	metal oxide (1%)
R322	1-214-112-00	Ⓐ	150	¼W	metal oxide (1%)
R323	1-214-100-00	Ⓐ	47	¼W	metal oxide (1%)
R326,327	1-214-140-00	Ⓐ	2.2 k	¼W	metal oxide (1%)
R328	1-214-108-00	Ⓐ	100	¼W	metal oxide (1%)
R329	1-214-122-00	Ⓐ	390	¼W	metal oxide (1%)
R401	1-214-156-00	Ⓐ	10 k	¼W	metal oxide (1%)
R402	1-214-132-00	Ⓐ	1 k	¼W	metal oxide (1%)
R403	1-214-156-00	Ⓐ	10 k	¼W	metal oxide (1%)
R408	1-214-162-00	Ⓐ	18 k	¼W	metal oxide (1%)
R409	1-214-176-00	Ⓐ	68 k	¼W	metal oxide (1%)
R471	1-214-162-00	Ⓐ	18 k	¼W	metal oxide (1%)
R472	1-214-176-00	Ⓐ	68 k	¼W	metal oxide (1%)
R475	1-214-151-00	Ⓐ	6.2 k	¼W	metal oxide (1%)
R476	1-214-144-00	Ⓐ	3.3 k	¼W	metal oxide (1%)
R477	1-214-151-00	Ⓐ	6.2 k	¼W	metal oxide (1%)
R478	1-214-144-00	Ⓐ	3.3 k	¼W	metal oxide (1%)
R622	⚠1-206-642-00	Ⓐ	120	2W	metal oxide (nonflammable)
R631	⚠1-206-640-00	Ⓐ	100	2W	metal oxide (nonflammable)
R701–703	⚠1-244-849-00	Ⓐ	100	½W	carbon
R704	1-244-869-00	Ⓐ	680	½W	carbon
R709	⚠1-206-672-00	Ⓐ	2.2 k	2W	metal oxide (nonflammable)
R751,752	⚠1-246-529-00	Ⓐ	220 k	¼W	carbon
R903	1-214-180-00	Ⓐ	100 k	¼W	metal oxide (1%)
R904	1-214-168-00	Ⓐ	33 k	¼W	metal oxide (1%)
R905	1-214-180-00	Ⓐ	100 k	¼W	metal oxide (1%)
R906	1-214-168-00	Ⓐ	33 k	¼W	metal oxide (1%)
R907–910	1-214-180-00	Ⓐ	100 k	¼W	metal oxide (1%)
R1502	⚠1-214-167-00	Ⓐ	30 k	¼W	metal oxide (1%)
R1503	⚠1-214-128-00	Ⓐ	680	¼W	metal oxide (1%)
R1504,1505	⚠1-214-142-00	Ⓐ	2.7 k	¼W	metal oxide (1%)
R1506	⚠1-212-369-00	Ⓑ	5.6	1W	metal oxide
R1507 – R1510	⚠1-212-356-00	Ⓑ	0.47	1W	metal oxide (nonflammable)
RV101,201	1-224-247-XX	Ⓒ	100, adjustable; dc balance		

Ref. No.	*Part No.*		*Description*
RV401	1-224-491-00	Ⓑ	22 k, adjustable; 33 rpm osc freq.
RV402	1-224-661-00	Ⓑ	47 k, adjustable; 45 rpm osc freq.
RV403	1-224-491-00	Ⓑ	22 k, adjustable; 33 rpm speed
RV404	1-224-661-00	Ⓑ	47 k, adjustable; 45 rpm speed
RV405	1-224-489-00	Ⓑ	2.2 k, adjustable; gain
RV406	1-224-660-00	Ⓑ	1 k, adjustable; gain
RV407	1-224-490-00	Ⓑ	4.7 k, adjustable; offset
RV408	1-224-490-00	Ⓑ	4.7 k, adjustable; offset
RV601	1-224-490-00	Ⓑ	4.7 k, adjustable; auto return
RV751	1-226-150-00	Ⓑ	20 k, variable with switch; PITCH

MISCELLANEOUS

CNJ1	⚠1-509-547-00	Ⓑ	Connector, 3-p; AC IN
CNJ2	1-509-991-00	Ⓑ	Socket, 11-p; REMOTE CONTROL
F1	⚠1-532-237-00	Ⓑ	Fuse, 3.15 AT
F2	⚠1-532-259-00	Ⓑ	Fuse, 1.6 AT
F3,4	⚠1-532-273-00	Ⓑ	Fuse, 250 mAT
F5–7	⚠1-532-469-00	Ⓒ	Fuse, 100 mAT
J901–904	1-507-416-XX	Ⓒ	Pin Jack, 4-p; PHONO, LINE OUT
M1	A-4608-034-A	Ⓩ	Motor (A) Ass'y
M2	8-835-001-XX	Ⓚ	Motor (B), DNF-1001A
MGH	1-543-079-00	Ⓘ	Head, speed detecting
NL1	⚠1-519-138-11	Ⓖ	Lamp, neon
PC	1-800-343-00	Ⓒ	CdS
PL1	1-518-234-00	Ⓑ	Lamp, 6 V 100 mA
PM1	1-454-187-00	Ⓕ	Solenoid, brake
RY401	1-515-296-00	Ⓕ	Relay
RY701	1-515-278-00	Ⓕ	Relay
RY901	1-515-294-11	Ⓕ	Relay, reed
S5	⚠1-552-295-12	Ⓕ	Switch, rotary; POWER
S6	1-516-657-00	Ⓒ	Switch, miniature; return
S901	1-552-296-00	Ⓚ	Switch, rotary; AMP SELECTOR
S902,903	1-552-297-00	Ⓖ	Switch, rotary; LOAD
X401	1-527-304-00	Ⓕ	Crystal

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*	*Description*
	1-452-138-00	Ⓖ Magnet
	1-533-051-XX	Ⓐ Holder, cylindrical lamp
	1-536-401-XX	Ⓐ Terminal Strip, 1L1
	1-551-232-00	Ⓜ Cord with Connector, for remote control unit
	1-561-094-00	Ⓚ Connector
	1-586-737-00	Ⓒ Remote Control Unit

PACKING MATERIALS AND ACCESSORIES

Part No.	*Description*
X-2219-805-0	Ⓒ Brush Ass'y
1-551-315-00	Ⓗ Cord, connection; RK-112
3-701-616-00	Ⓐ Bag, plastic
3-701-620-00	Ⓐ Bag, plastic
3-770-427-11	Ⓛ Manual, instruction
3-793-395-14	Ⓐ Gauge, tracking error
3-794-154-11	Ⓜ Booklet, technical information
4-808-461-00	Ⓔ Adaptor, 45 rpm
4-844-442-00	Ⓒ Bag, plastic
4-847-092-00	Ⓒ Screwdriver
4-855-176-00	Ⓒ Screw, turntable
4-855-208-00	Ⓒ Escutcheon, spindle
4-855-247-00	Ⓔ Screw, plate
4-855-248-00	Ⓘ Weight, sub
4-855-261-00	Ⓟ Rubber Mat, turntable
4-855-284-00	Ⓣ Turntable
4-855-606-00	Ⓒ Frame
4-855-607-00	Ⓑ Sheet, protection
4-855-608-00	Ⓒ Bag, protection
4-855-609-00	Ⓖ Cushion, upper
4-855-610-00	Ⓔ Cushion, inner
4-855-611-00	Ⓕ Cushion, lower
4-855-612-00	Ⓔ Cushion, turntable
4-855-613-00	Ⓑ Case, accessory
4-855-614-00	Ⓑ Case, accessory
4-855-633-00	Ⓚ Carton
4-855-634-00	Ⓐ Cushion, weight bar
4-855-635-00	Ⓐ Sheet (B), protection

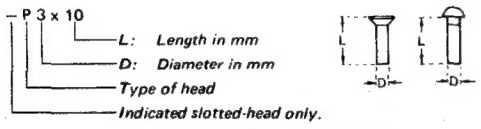
1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

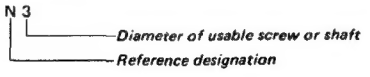
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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